



# Unsuccessful Course Completion and Student Success

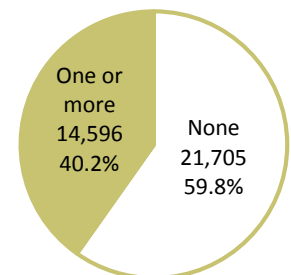
In April 2012, IRP&E assessed the impact of an unsuccessful course attempt (defined as D, F, W, or U grade) in six popular lower-level undergraduate courses (see [Probability of Retention and Graduation after an Unsuccessful Course Attempt](#)). Overall, the 2012 study found a strong negative association between unsuccessful course attempts and retention and graduation. This current study expands on the original by examining the association between an *unsuccessful* course completion (defined as earning a D, F, or U grade) in *any* undergraduate course on retention and graduation for first-time, full-time (FTFT) students.

Of the approximately 36,000 FTFT undergraduate students included in this study, over 14,000 students had unsuccessful course completions in their first year at CSU; an average of about 1,800 students per year. Given the large number of students with unsuccessful course completions, gains in retention and graduation rates could be obtained if institutional policies and programs can intervene early, before students are poised to earn D, F, or U grades.

## Key Findings

- Two in five FTFT students had at least one unsuccessful course completion (received a D, F, or U grade) in their first year at CSU.
- Students with at least one unsatisfactory grade (D, F, or U) had significantly lower retention and graduation rates than those with no unsatisfactory grades; first generation students and Pell Grant recipients with at least one unsuccessful course grade had the lowest retention and graduation rates.
- Holding everything constant<sup>1</sup>, a student with no unsuccessful course completions has a predicted first year retention rate 7.2 percentage points higher than an identical student with at least one unsuccessful course completion (95.2% compared to 88.0%).
- Holding everything constant, a student with no unsuccessful course completions has a predicted six year graduation rate of 86.4% compared to 60.2% for a student with at least one unsuccessful course completion (26.2 percentage point difference).
- Overall, an unsuccessful course completion is negatively associated with persistence and graduation regardless of a variety of academic and demographic attributes; the magnitude of the association is similar across student subgroups including those typically underserved by higher education.
- Unsuccessful course completion could be used as an early indicator for current institutional interventions around student success goals and decreasing unsuccessful course completions should contribute to gap-closing efforts as well as increasing overall graduation rates.

**Figure 1. Unsuccessful Course Completion in First Year**



<sup>1</sup> Throughout this report, models assume male, resident student with a non-STEM declared major and 115 Index score; also assume non-FG, non-RM and non-Pell.



## Methods

This study includes FTFT undergraduate students who first enrolled at CSU between FA10 and FA17 and persisted through the end of their first spring semester. This limitation ensures all students have the same opportunity to fail a course (receive a D, F, or U grade) in their first academic year. However, the persistence and graduation rates presented in this report will be slightly higher than IRP&E's published rates as this report excludes the students that left within their first academic year. In other words, this study excludes students that persisted to the end of their first fall but did not return for their first spring semester and these students are included in IRP&E's published retention and graduation rates.

Logistic regression models explore the multivariate association between an unsuccessful course completion within the first year and freshman retention (persistence to the start of the second fall semester) as well as six year graduation rates (graduation by the sixth summer after initial enrollment) after controlling for students' demographic and academic attributes. Both models control for the same demographic (e.g., gender, minoritized status, residency, first generation, Pell Grant status) and academic (e.g., STEM status, undeclared status, CCHE Index) attributes; thus, the models only differ in the outcome variable they predict (e.g., freshman retention or graduation by sixth summer). These models predict the differences in success rates based on whether or not the student had unsuccessful course completion(s) within their first year and are the premise for student success policies that focus on the first four weeks.

Additionally, this study builds on prior work by including a third model that expands on the graduation model. This third model controls for first-year academic performance (cumulative GPA) and adjusts the covariate of interest (unsuccessful course completion) from the first year to the first fall semester. These model adjustments provide early indicators (metrics available at the end of first-fall) that identify students with lower-than-average probabilities of success. This third model provides estimates of the impact of interventions on overall graduation rates assuming policies can change the success for students with unsuccessful course completion(s). Detailed tables with the complete statistics from all three regression models can be found in *Appendix B: Regression Models* (p. 11).

## Student Profile

Table 1 displays the sociodemographic and academic characteristics of the students for each of the cohorts included in the study.

**Table 1. Student Characteristics by Term**

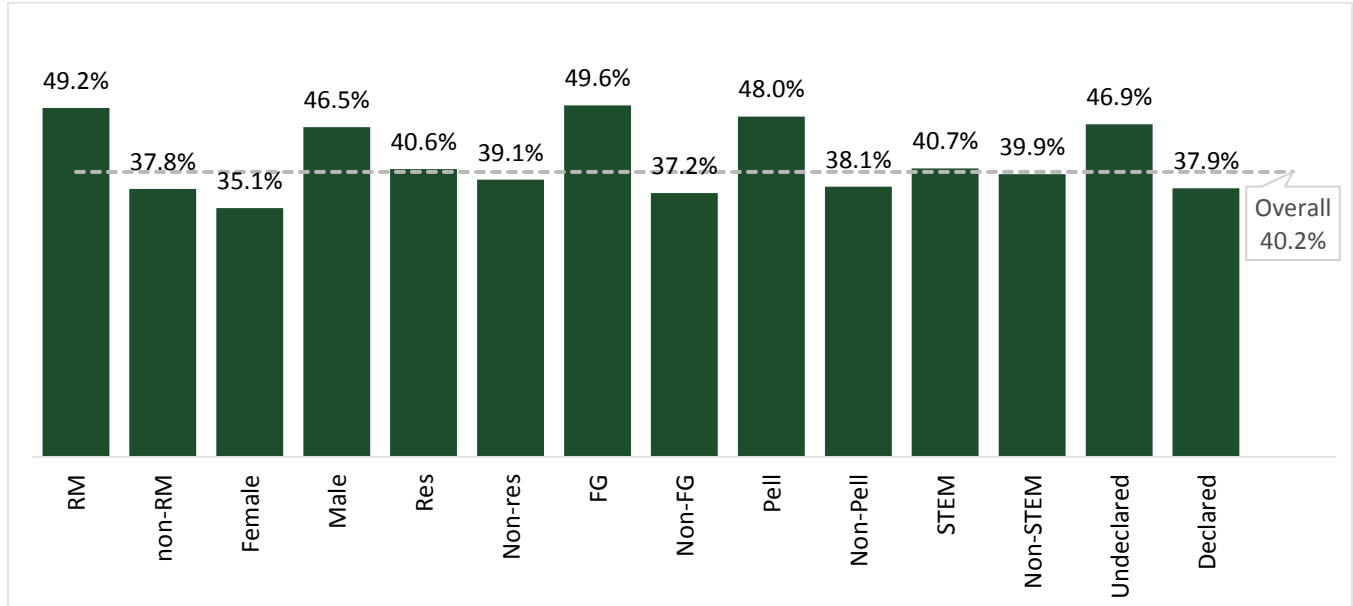
	FA10	FA11	FA12	FA13	FA14	FA15	FA16	FA17	Overall
Racially minoritized	16.5%	19.0%	19.3%	20.4%	20.5%	21.2%	24.7%	27.0%	21.2%
Female	55.9%	55.6%	55.7%	54.8%	54.9%	53.2%	56.1%	54.0%	55.0%
Resident	79.6%	77.1%	74.8%	74.0%	72.5%	69.7%	68.2%	66.5%	72.7%
First generation	23.2%	25.8%	26.1%	24.0%	23.8%	25.6%	22.3%	22.2%	24.1%
Pell Grant recipient	22.0%	24.2%	22.7%	21.2%	20.8%	20.3%	20.3%	21.4%	21.6%
Stem major	32.0%	33.5%	35.1%	36.5%	38.3%	39.2%	39.3%	40.2%	36.8%
Undeclared major	28.3%	26.0%	28.5%	26.1%	24.9%	26.3%	21.7%	24.0%	25.7%
CCHE index	114.2	115.2	114.9	115.2	115.2	115.0	115.8	115.6	115.2
Cumulative GPA	2.83	2.90	2.93	2.92	2.96	2.96	2.96	2.97	2.93
Failed course in first year	44.4%	41.9%	40.5%	39.9%	38.6%	38.3%	37.9%	40.4%	40.2%



Overall, student characteristics were similar between cohort groups, though students identified as racially minoritized and those with STEM majors have increased steadily over the years and the proportion of Colorado residents has decreased. The proportion of students with at least one unsuccessful course completion in their first year was highest in the FA10 cohort and lowest in the FA16 cohort (44.4% versus 37.9%).

Figure 2 displays the course failure rates for each student subgroup. The data for Figure 2 can be found in Table A 1; Table A 2 displays this information by cohort term (p. 8).

**Figure 2. Unsuccessful Course Completion Rates by Student Characteristic**



Students identified as racially minoritized (RM), male, Pell Grant recipients, undeclared, and first generation (FG) tended to have above-average unsuccessful course completion rates. For instance, among FTFT students from FA10-FA17, 49.6% of FG students had an unsuccessful course completion compared to 37.2% of non-FG students. Disparity in unsuccessful course completions by RM, FG, and Pell status indicates that changing these academic behaviors could be a strategy for closing retention and graduation rate gaps across demographic attributes.

Appendix A also includes additional subgroup comparisons by ethnicity and college. Compared by ethnicity (Table A 3), students identified as black, Hawaiian/Pacific Islander, or Native American had significantly higher than average unsuccessful course completion rates. Compared by college (Table A 4), students in the colleges of Business and Veterinary Medicine and Biomedical Sciences had lower rates of unsuccessful completion while students with undeclared majors (Intra-University) had higher rates.

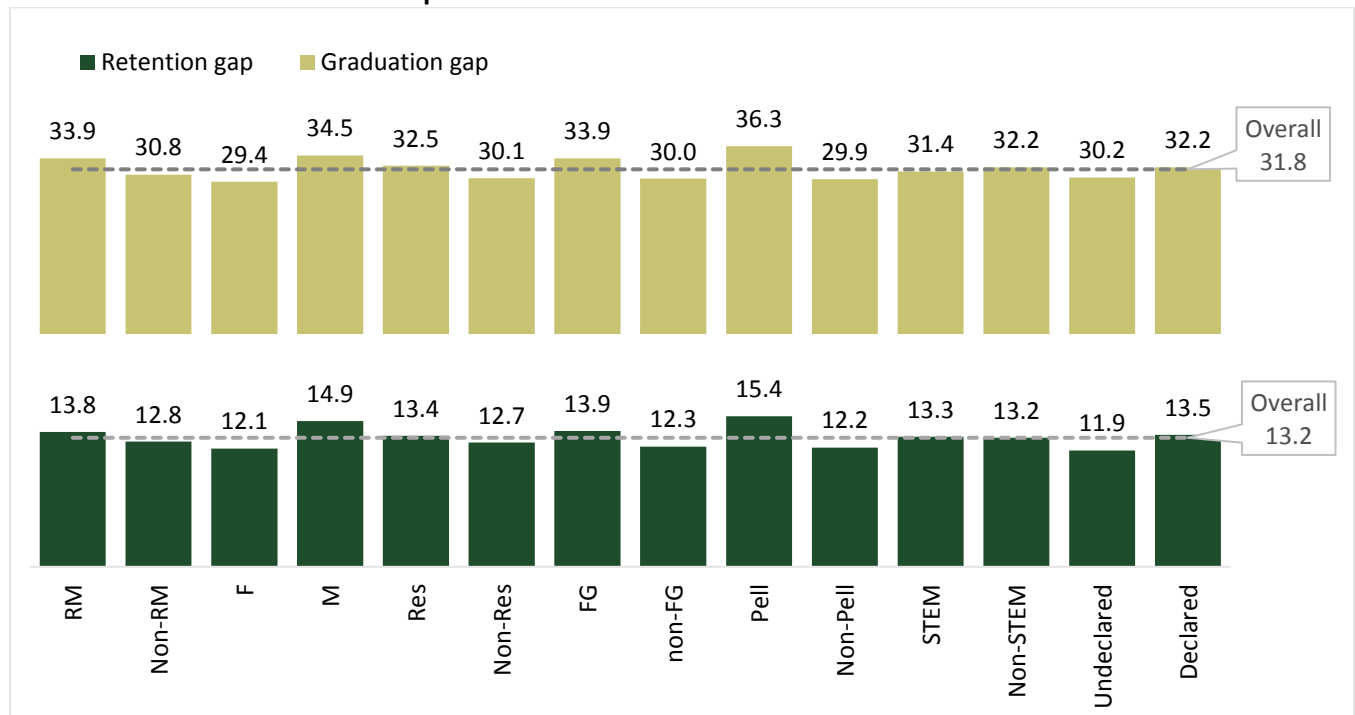
### Differences in Retention and Graduation Rates by Unsuccessful Course Completion

Table 2 displays the freshman retention and graduation rates by unsuccessful course completion status. Students with at least one failed course had significantly lower retention and graduation rates than those with no failures. The freshman retention rate for students with unsuccessful course completions was 13.2 percentage points (PP) lower than those without (77.1% versus 90.3%) and the six year graduation rate was 32.2 PP lower (50.3% versus 82.1%).

**Table 2. Freshman Retention and Graduation Rates Compared by Unsuccessful Course Completion in First Year**

	Freshman retention		Graduate in 6 years	
No failed courses	21,703	90.3%	7,637	82.1%
At least one failed course	14,592	77.1%	5,586	50.3%
Overall	36,295	85.0%	13,223	68.6%

Figure 3 displays the PP gap in freshman retention and graduation rate by unsuccessful course completion status across each demographic attribute and derived from Table A 5 and Table A 6 in Appendix A. These tables provide the freshmen retention and graduation rates by demographic attribute by unsuccessful course completion status.

**Figure 3. Percentage Point Gap in Freshman Retention and Graduation Rates between Students with and without Unsuccessful Course Completions**

Overall, the gaps by unsuccessful course completion were similar by demographic attribute, although slightly larger for Pell recipients and male students. For example, Pell grant recipients with an unsuccessful course completion had a freshman retention rate of 73.5% compared the 88.9% rate for Pell recipients that do not have an unsuccessful course completion in the first year (see Table A 5). This 15.4 PP gap was slightly larger than the overall gap of about 13.2 PP.

It is important to assess if the bivariate association between unsuccessful course completion and freshman retention or graduation differ by demographic attribute in order to understand if policies aimed at decreasing the unsuccessful course completion rate will have differential effects on specific populations. Given the similarity in the PP gap across subgroups (see Figure 3, Table A 5, and Table A 6), decreasing the unsuccessful course completion rate should have a similar impact on persistence and graduation rates for *all* demographic



groups; although, since unsuccessful course completions are more pronounced among male, FG, RM, and Pell students (Figure 2), any policy that decreases these rates should help close differences in rates for students with these attributes.

### Multivariate Association of Unsuccessful Course Completion with Freshman Retention

Table B 1 (p. 11) displays the regression statistics of freshman retention for students with at least one unsuccessful course completion in their first year; the odds ratios for this model are displayed in Table 3.

**Table 3. Retention Odds Ratios**

Student Characteristics	Odds ratio
At least one unsuccessful course in first year	0.372
Female	0.941
Non-resident	0.631
First generation	0.728
Racially minoritized	NS
Pell Grant recipient	0.862
STEM major	NS
Undeclared major	NS
CCHE Index	1.010

- The odds ratio of 0.372 indicates a student with at least one failed course in the first year has 62.8% (1-0.372) lower odds of being retained after controlling for sociodemographic and academic characteristics.
- Thus, a student with *no unsatisfactory grades* has a predicted first year retention rate of 95.2%.
- Should this same student earn *one or more unsatisfactory grades* in their first year, their predicted retention drops to 88.0%.
- Overall, holding everything constant, the model predicts a 7.2 PP gap in retention between students with unsuccessful courses in their first year versus those without after controlling for sociodemographic and academic characteristics.

### Multivariate Association of Unsuccessful Course Completion with Six Year Graduation

Table B 2 (p.11) displays the regression statistics of six year graduation for students with at least one unsuccessful course completion in their first year; the odds ratios for this model are displayed in Table 4.

**Table 4. Six Year Graduation Odds Ratios**

Student Characteristics	Odds ratio
At least one unsuccessful course in first year	0.239
Female	1.126
Non-resident	0.708
First generation	0.690
Racially minoritized	0.848
Pell Grant recipient	0.859
STEM major	NS
Undeclared major	NS
CCHE Index	1.011

- The odds ratio of 0.239 indicates a student with at least one failed course in the first year has 76.1% (1-0.239) lower odds of graduating within six years after controlling for sociodemographic and academic characteristics.
- Thus, a student with *no unsatisfactory grades* has a predicted graduation rate of 86.4%.
- Should this same student earn *one or more unsatisfactory grades* in their first year, their predicted graduation drops to 60.2%.
- Overall, holding everything constant, the model predicts a 26.1 PP gap in graduation between students with unsuccessful courses in their first year versus those without after controlling for sociodemographic and academic characteristics.



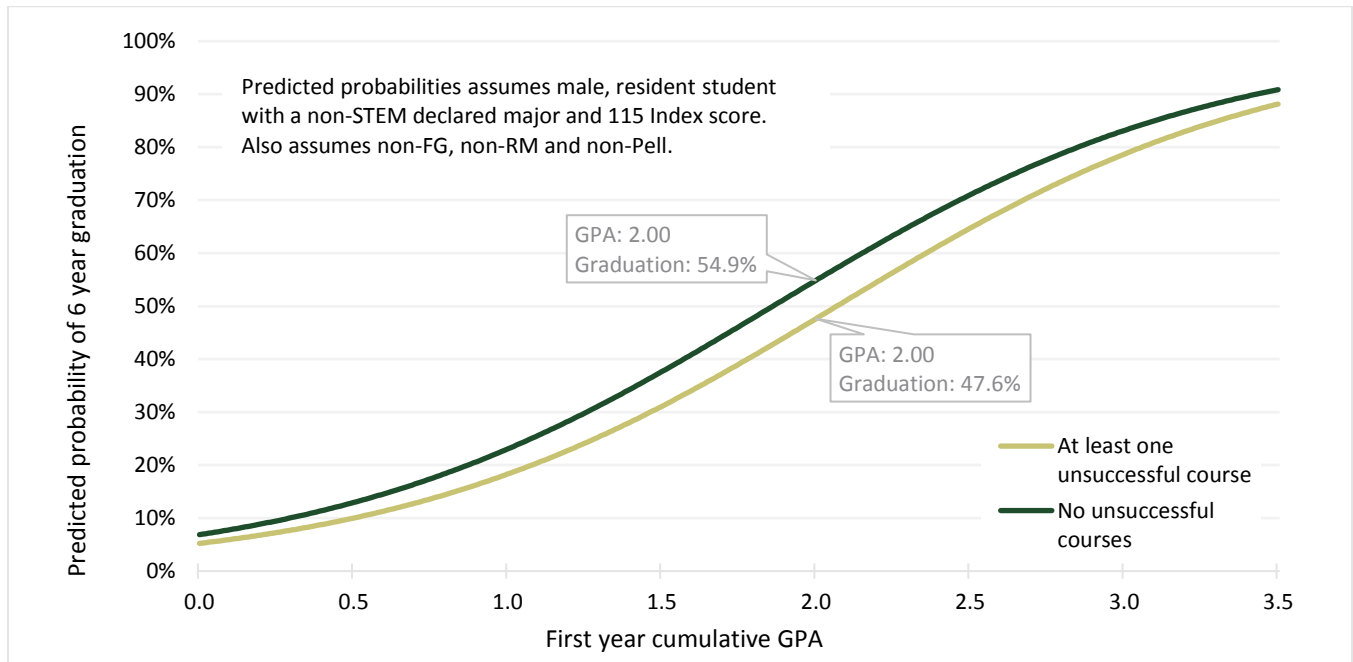
Controlling for academic and demographic characteristics reduced the observed differences in graduation and persistence rates (see Table 2 for the observed rates). For example, there is a 7.2 PP difference in predicted freshman retention compared to an observed difference of 13.2. Similarly, the predicted difference in graduation is 26.1 PP, which is smaller than the observed 31.8 PP difference. These models indicate that an unsuccessful course completion is negatively associated with persistence and graduation at CSU regardless of a variety of academic and demographic attributes. Additionally, the bivariate analysis presented in Figure 3 show the magnitude of the associations are relatively similar regardless if the student identifies with a group underserved by higher education.

### Multivariate Association of First Fall Unsuccessful Course Completion with Sixth Year Graduation Controlling for GPA

The prior models did not control for CSU academic performance, this section focuses on the association of unsuccessful course grades in the first *fall* semester using the same assumptions as previous models as well as controlling for cumulative GPA at the end of the first spring semester. Controlling for first year academic performance has the practical application of providing a basis for spring semester interventions with students that had at least one unsuccessful course completion in the previous fall semester. As resources are limited and it is not feasible to assume that all students can have meaningful interactions with faculty or staff, including first year GPA in the model provides a basis to target resources and maximize results.

Figure 4 graphs these regression results to display the predicted probability of graduating within six years for two groups of students (those with an unsuccessful course completion in the first fall semester and those without this unsuccessful course completion) by first-year cumulative GPA.

**Figure 4. Predicted Probability of Sixth Year Graduation with at Least One Unsuccessful Course Completion in the First Fall Semester**



Overall, a student with at least one unsatisfactory grade in their first fall semester has 25.2% lower odds of graduating within six years than a student with no unsatisfactory grades after controlling for first-year GPA and a



variety of other demographic and academic attributes. Detailed tables with the complete statistics for this regression model can be found in *Appendix B: Regression Models* (p. 11)

The predicted probabilities assumes male, resident student with a non-STEM declared major and 115 Index score. The model also assumes non-FG, non-RM and non-Pell. These assumptions do not weaken the interpretation's applicability to gap-closing efforts as the magnitude of the association does not differ for FG, RM, or Pell recipients, but the predicted probabilities are lower for students with any combination of these attributes (e.g., the plotted lines shift downward, but the distance between the lines stays the same). A student with a 2.93 GPA (the average for this study) and at least no unsuccessful course completions has a predicted sixth year graduation rate of 81.7% compared to 77.0% for the same student with unsuccessful course completions, a difference of 4.7 PP. The largest gap in predicted graduation occurs at a 2.00 GPA. At this level of academic performance, a student with no unsuccessful courses has a predicted graduation rate of 54.9%. If this student earns at least one unsatisfactory grade in their first fall, the probability of their graduating drops to 47.6%, a difference of 7.2 percentage points.

Given the large number of students with an unsuccessful course completion and the strength and magnitude of the association between unsuccessful course completion and graduation, CSU has an opportunity to increase its overall graduation rates. For example, there were about 500 students in the FA12 FTFT cohort that earned a 2.0 or higher cumulative GPA in their first-year but had an unsuccessful course completion in their first fall semester. These students graduated at rate of about 68%. If their graduation rate could be increased 7.2 PP (as the third models predicts) than approximately 55 more students would have graduated. These additional 55 students would have increased the overall graduation rate by about 1.2 PP.

The above example assumes that an intervention can make-up for the psychosocial impact of an unsuccessful course completion. An alternative approach is to strategically try to decrease unsuccessful attempts with current institutional programs such as the First Four Week's faulty initiative and Early Performance Feedback. A dual approach (intervening with higher performing students that have an unsatisfactory course grade as well as trying to decrease the prevalence of unsuccessful course completion in the first year) would be the most efficient.

## Conclusions

Unsuccessful course completions are common among FTFT students and this academic behavior has a strong negative association with persistence and graduation. For instance, about 40% of FTFT students from each cohort (about 1,800 students each semester) have at least one unsuccessful course completion and this behavior is associated with significantly reduced odds of persistence and graduation even after controlling for a variety of confounding attributes.

Targeting the students with unsuccessful course completion, and trying to reduce this occurrence, is an avenue to progress towards student success goals (i.e., overall graduation rate of 80% and eliminating gaps in rates). Unsatisfactory course completions are more common among students who are underserved by higher education (i.e., higher rates among FG, RM, and Pell recipients) and the magnitude of association is relatively consistent for all student groups (reducing these occurrences should increase graduation rates for all demographic groups). Therefore, decreasing unsuccessful course completions should contribute towards gap-closing efforts as well as increasing overall graduation rates. Additionally, an unsuccessful course completion could be used as an early indicator for interventions around psychosocial impacts of being unsuccessful in a course during the first fall semester.



## Appendix A: Student Characteristics

**Table A 1. Student Characteristics by Unsuccessful Course Completion in First Year**

	No unsuccessful course completions		At least one unsuccessful course completion		Total	
Racially minoritized	3,910	50.8%	3,787	49.2%	7,697	100.0%
Non-minoritized	17,795	62.2%	10,809	37.8%	28,604	100.0%
Female	12,962	64.9%	7,009	35.1%	19,971	100.0%
Male	8,743	53.5%	7,587	46.5%	16,330	100.0%
Resident	15,659	59.4%	10,716	40.6%	26,375	100.0%
Non-resident	6,046	60.9%	3,880	39.1%	9,926	100.0%
First generation	4,407	50.4%	4,333	49.6%	8,740	100.0%
Non-first generation	17,298	62.8%	10,263	37.2%	27,561	100.0%
Pell Grant recipient	4,074	52.0%	3,762	48.0%	7,836	100.0%
Non-Pell Grant recipient	17,631	61.9%	10,834	38.1%	28,465	100.0%
Stem major	7,936	59.3%	5,440	40.7%	13,376	100.0%
Non-STEM major	13,769	60.1%	9,156	39.9%	22,925	100.0%
Undeclared major	4,943	53.1%	4,374	46.9%	9,317	100.0%
Declared major	16,762	62.1%	10,222	37.9%	26,984	100.0%
Overall	21,705	59.8%	14,596	40.2%	36,301	100.0%

**Table A 2. Unsuccessful Course Completion Rates by Student Characteristics by Term**

	FA10	FA11	FA12	FA13	FA14	FA15	FA16	FA17	Overall
Racially minoritized	54.1%	53.5%	48.7%	47.5%	48.8%	46.7%	45.7%	50.6%	49.2%
Non-minoritized	42.5%	39.2%	38.6%	38.0%	36.0%	36.1%	35.4%	36.7%	37.8%
Female	38.0%	37.6%	35.2%	34.4%	33.7%	33.5%	34.0%	34.6%	35.1%
Male	52.5%	47.2%	47.3%	46.6%	44.6%	43.9%	42.9%	47.3%	46.5%
Resident	45.2%	42.6%	41.2%	40.2%	38.9%	38.7%	37.8%	40.1%	40.6%
Non-resident	41.4%	39.5%	38.6%	39.1%	37.7%	37.6%	38.1%	41.1%	39.1%
First generation	55.2%	51.8%	46.9%	47.5%	48.1%	46.6%	48.5%	52.5%	49.6%
Non-first generation	41.1%	38.4%	38.3%	37.5%	35.6%	35.5%	34.9%	37.0%	37.2%
Pell Grant recipient	52.8%	48.2%	46.8%	46.9%	49.3%	47.0%	44.9%	48.3%	48.0%
Non-Pell Grant recipient	42.0%	39.9%	38.7%	38.0%	35.8%	36.1%	36.1%	38.3%	38.1%
Stem major	44.6%	44.9%	43.1%	40.7%	38.5%	37.6%	37.7%	40.3%	40.7%
Non-STEM major	44.3%	40.4%	39.1%	39.4%	38.6%	38.8%	38.1%	40.5%	39.9%
Undeclared major	53.1%	46.7%	45.5%	45.4%	42.6%	46.6%	44.2%	50.6%	46.9%
Declared major	40.9%	40.2%	38.5%	38.0%	37.3%	35.4%	36.1%	37.2%	37.9%
Overall	44.4%	41.9%	40.5%	39.9%	38.6%	38.3%	37.9%	40.4%	40.2%



**Table A 3. Student Ethnicity by Unsuccessful Course Completion in First Year**

		No unsuccessful course completions		At least one unsuccessful course completion		Subtotal	
Non-minoritized	International	296	56.1%	232	43.9%	528	100.0%
	No Response	724	61.2%	459	38.8%	1,183	100.0%
	White	16,775	62.4%	10,118	37.6%	26,893	100.0%
	Subtotal	17,795	62.2%	10,809	37.8%	28,604	100.0%
Racially minoritized	Asian	519	55.9%	409	44.1%	928	100.0%
	Black	353	42.2%	483	57.8%	836	100.0%
	Hawaiian/Pac. Islander	23	42.6%	31	57.4%	54	100.0%
	Hispanic/Latino	2,224	50.3%	2,200	49.7%	4,424	100.0%
	Multi-Racial	709	55.5%	568	44.5%	1,277	100.0%
	Native American	82	46.1%	96	53.9%	178	100.0%
	Subtotal	3,910	50.8%	3,787	49.2%	7,697	100.0%
Overall		21,705	59.8%	14,596	40.2%	36,301	100.0%

**Table A 4. College by Unsuccessful Course Completion in First Year**

	No unsuccessful course completions		At least one unsuccessful course completion		Total	
Agricultural Sciences	1,134	56.9%	859	43.1%	1,993	100.0%
Business	2,221	76.3%	689	23.7%	2,910	100.0%
Engineering	2,601	60.0%	1,732	40.0%	4,333	100.0%
Health and Human Sciences	2,642	60.1%	1,755	39.9%	4,397	100.0%
Intra-University	4,960	53.1%	4,387	46.9%	9,347	100.0%
Liberal Arts	2,815	64.6%	1,541	35.4%	4,356	100.0%
Natural Sciences	3,707	57.2%	2,771	42.8%	6,478	100.0%
Veterinary Medicine and Biomedical Sciences	861	73.5%	311	26.5%	1,172	100.0%
Warner College of Natural Resources	764	58.1%	551	41.9%	1,315	100.0%
Overall	21,705	59.8%	14,596	40.2%	36,301	100.0%

**Table A 5. Freshman Retention by Student Characteristics by Unsuccessful Course Completion in First Year**

	No unsuccessful course completions		At least one unsuccessful course completion		Overall	
Racially minoritized	3,909	89.2%	3,786	75.4%	7,695	82.4%
Non-minoritized	17,794	90.5%	10,806	77.7%	28,600	85.7%
Female	12,961	89.1%	7,007	77.0%	19,968	84.9%
Male	8,742	92.1%	7,585	77.2%	16,327	85.2%
Resident	15,658	91.5%	10,712	78.1%	26,370	86.1%
Non-resident	6,045	87.1%	3,880	74.4%	9,925	82.1%
First generation	4,407	86.7%	4,332	72.8%	8,739	79.8%
Non-first generation	17,296	91.2%	10,260	78.9%	27,556	86.6%
Pell Grant recipient	4,074	88.9%	3,761	73.5%	7,835	81.5%
Non-Pell Grant recipient	17,629	90.6%	10,831	78.4%	28,460	86.0%
Stem major	7,936	91.8%	5,439	78.5%	13,375	86.4%
Non-STEM major	13,767	89.5%	9,153	76.3%	22,920	84.2%
Undeclared major	4,941	88.4%	4,373	76.5%	9,314	82.8%
Declared major	16,762	90.9%	10,219	77.4%	26,981	85.7%
Overall	21,703	90.3%	14,592	77.1%	36,295	85.0%

**Table A 6. Six Year Graduation by Student Characteristics by Unsuccessful Course Completion in First Year**

	No unsuccessful course completions		At least one unsuccessful course completion		Overall	
Racially minoritized	1,160	78.6%	1,258	44.7%	2,418	61.0%
Non-minoritized	6,477	82.7%	4,328	51.9%	10,805	70.3%
Female	4,652	81.4%	2,725	52.0%	7,377	70.5%
Male	2,985	83.1%	2,861	48.6%	5,846	66.3%
Resident	5,815	83.5%	4,386	51.0%	10,201	69.5%
Non-resident	1,822	77.7%	1,200	47.6%	3,022	65.7%
First generation	1,616	76.4%	1,693	42.5%	3,309	59.1%
Non-first generation	6,021	83.6%	3,893	53.6%	9,914	71.8%
Pell Grant recipient	1,539	80.2%	1,495	43.9%	3,034	62.3%
Non-Pell Grant recipient	6,098	82.5%	4,091	52.6%	10,189	70.5%
Stem major	2,477	84.1%	1,957	52.7%	4,434	70.2%
Non-STEM major	5,160	81.1%	3,629	48.9%	8,789	67.8%
Undeclared major	1,881	79.5%	1,768	49.3%	3,649	64.8%
Declared major	5,756	82.9%	3,818	50.7%	9,574	70.1%
Overall	7,637	82.1%	5,586	50.3%	13,223	68.6%



## Appendix B: Regression Models

Except for CCHE Index and constant, all variables in the models are categorical where a value of "1" equals "true" and a value of "0" equals "false." For example, for the variable "female," a value of "1" indicates a female student while a value of "0" indicates a male student.

**Table B 1. Regression Statistics for Freshman Retention with at Least One Failed Course in the First Year**

Variables in the Equation	B	S.E.	Wald	df	Sig.	Odds ratio
At least one unsuccessful course in first year	-0.988	0.041	577.787	1	0.000	0.372
Female	-0.061	0.038	2.539	1	0.111	0.941
Non-resident	-0.461	0.041	124.917	1	0.000	0.631
First generation	-0.318	0.044	51.587	1	0.000	0.728
Racially minoritized	-0.003	0.046	0.003	1	0.955	0.997
Pell Grant recipient	-0.149	0.047	10.220	1	0.001	0.862
STEM major	0.066	0.046	2.070	1	0.150	1.068
Undeclared major	-0.027	0.048	0.315	1	0.574	0.973
CCHE Index	0.010	0.002	26.678	1	0.000	1.010
Constant	1.857	0.226	67.350	1	0.000	6.403

Notes: Number of cases included in analysis: 33,548

Correctly predicted: 90.1%

Nagelkerke  $R^2 = 0.068$

**Table B 2. Regression Statistics for Six Year Graduation with at Least One Failed Course in the First Year**

Variables in the Equation	B	S.E.	Wald	df	Sig.	Odds ratio
At least one unsuccessful course in first year	-1.430	0.047	923.918	1	0.000	0.239
Female	0.119	0.044	7.108	1	0.008	1.126
Non-resident	-0.345	0.053	42.783	1	0.000	0.708
First generation	-0.371	0.051	52.541	1	0.000	0.690
Racially minoritized	-0.165	0.056	8.746	1	0.003	0.848
Pell Grant recipient	-0.152	0.054	8.102	1	0.004	0.859
STEM major	0.066	0.054	1.480	1	0.224	1.068
Undeclared major	0.021	0.055	0.138	1	0.711	1.021
CCHE Index	0.011	0.002	23.057	1	0.000	1.011
Constant	0.608	0.267	5.175	1	0.023	1.837

Notes: Number of cases included in analysis: 12,294

Correctly predicted: 73.3%

Nagelkerke  $R^2 = 0.171$

**Table B 3. Regression Statistics for Probability of Sixth Year Graduation with at Least One Failed Course in the First Fall Semester**

Variables in the Equation	B	S.E.	Wald	df	Sig.	Odds ratio
At least one unsuccessful course in first fall	-0.290	0.057	25.644	1	0.000	0.748
Female	-0.069	0.047	2.109	1	0.146	0.934
Non-resident	-0.398	0.055	52.096	1	0.000	0.672
First generation	-0.371	0.054	47.791	1	0.000	0.690
Racially minoritized	-0.171	0.059	8.489	1	0.004	0.843
Pell Grant recipient	-0.121	0.056	4.622	1	0.032	0.886
STEM major	0.255	0.057	19.850	1	0.000	1.291
Undeclared major	0.000	0.058	0.000	1	0.997	1.000
CCHE Index	-0.010	0.002	16.615	1	0.000	0.990
Cumulative GPA	1.401	0.045	953.950	1	0.000	4.058
Constant	-1.446	0.275	27.645	1	0.000	0.235

Notes: Number of cases included in analysis: 12,294

Correctly predicted: 78.1%

Nagelkerke  $R^2 = 0.266$