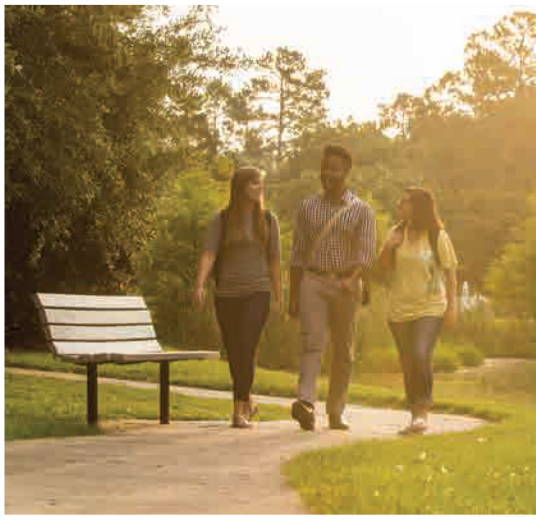
Data Analysis for Advising Symposium 2017

Gordon State College
419 College Drive
Barnesville, Georgia
March 1, 2017

Supplemental Materials and Examples





UNIVERSITY SYSTEM OF GEORGIA

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Data Analysis for Advising Systems Reference Table

Institution	Advising Model		Student Information System (Banner) Version		Degree Audit Service (DegreeWorks) Version	Predictive Analytics Software
	1st Half of Program	2nd Half of Program	Student Self-Service	Faculty and Advisor		
Research Universities						
Augusta University	Professional, Centralized	Faculty, Distributed	8.7.2	8.7.2	4.1.5 Student Education Planner	Yes
Georgia Institute of Technology	Professional, Distributed	Professional, Distributed	8.7.2	8.7.2	4.1.4	Yes
Georgia State University	Professional, Centralized	Professional, Centralized	8.7.2	8.7.2	4.1.6	Yes
University of Georgia	Professional, Distributed	Professional, Distributed	8.7.2	8.7.2	4.1.6, Student Education Planner	Yes
Comprehensive Universities						
Georgia Southern University	Professional, Distributed	Professional, Distributed	8.7.2	8.7.2	4.1.5	Yes
Kennesaw State University	Professional, Distributed	Professional, Distributed	8.8.1	8.8.1	4.1.4	Yes
University of West Georgia	Professional, Centralized	Faculty	8.7.2	8.7.2	4.1.4	Yes
Valdosta State University	Professional, Centralized	Faculty	8.7.1	8.7.1	4.1.3.1, Student Education Planner	Yes
State Universities						
Albany State University/Darton State College	Professional		* 8.7.2, Student 8.10	* 8.7.2	4.1.4 Student Education Planner	Yes
Armstrong State University	Professional, Centralized	Professional, Centralized	* 8.7.2, Student 8.10	* 8.7.2	* 4.1.4	Yes
Clayton State University	Professional, Centralized	Professional Centralized	8.8	8.5.4.3	4.1.1	Yes
Columbus State University	Professional, Distributed	Faculty, Distributed	8.10.7.1	8.7.2.2	* 4.1.4	No
Fort Valley State University	Professional, Centralized	Faculty	* 8.7.2, Student 8.10	* 8.7.2	* 4.1.4	No
Georgia College and State University	Professional, Centralized		8.7.1	8.7.1	4.1.6, Student Education Planner, WebScribe	Yes
Georgia Southwestern State University	Faculty	Faculty	* 8.7.2, Student 8.10	* 8.7.2	* 4.1.4	No
Middle Georgia State University	Professional, Distributed	Professional, Distributed	8.7.2	8.7.2	4.1.5	Yes
Savannah State University			* 8.7.2, Student 8.10	* 8.7.2	* 4.1.4	Yes
University of North Georgia	Professional		8.8.1	8.8.1	8.4	Yes

Institution	Advising Model		Student Information System (Banner) Version		Degree Audit Service (DegreeWorks) Version	Predictive Analytics Software
	1st Half of Program	2nd Half of Program	Student Self-Service	Faculty and Advisor		
State Colleges						
Abraham Baldwin Agricultural College	Faculty	Faculty	* 8.7.2, Banner XE Registration	* 8.7.2	*4.1.4, Student Education Planner	No
Atlanta Metropolitan State College	Faculty	Faculty	* 8.7.2, Student 8.10	* 8.7.2	*4.1.4	No
Bainbridge State College	Professional, Centralized	Faculty	* 8.7.2, Student 8.10	*8.7.2	*4.1.4	No
College of Coastal Georgia	Professional				*4.1.4	No
Dalton State College	Professional, Distributed	Faculty	* 8.7.2, Student 8.10	* 8.7.2	*4.1.4	Yes
East Georgia State College	Professional, Distributed	Professional, Distributed	8.8	8.8	6.1.1	Yes
Georgia Gwinnett College	Professional, Centralized	Faculty	* 8.7.2 Student 8.10	* 8.7.2	* 4.1.4	No
Georgia Highlands College	Faculty and Professional Combination	Faculty and Professional Combination	8.10.7	8.7.2	4.1.0	No
Gordon State College	Faculty	Faculty	8.7.2.2	8.7.2.2	4.1.0	No
South Georgia State College	Faculty	Faculty	* 8.7.2, Student 8.10, XE Registration	* 8.7.2	* 4.1.4, Student Education Planner	No

*Indicates service currently managed by Georgia BEST

Data Analysis for Advising
Common Advising Metrics

- Time to degree
- Retention rate
- Number of major changes
- Number of courses completed above program requirement
- Advisor to student ratio
- Walk-in advising sessions offered
- Advising forms issued/advising surveys completed
- Percentage of cohort enrolled in 15 hours per term
- Percentage of cohort earning 30 hours in first year
- Student learning outcomes:
    - Demonstrate knowledge of corer curriculum/major requirements
    - Demonstrate knowledge of impact to time to graduation and cost as a result of multiple major changes, changes to plan of study, and course withdrawals.
    - Understand importance of maintaining a satisfactory GPA as it applies to staying in good academic standing, transferring to other institutions, and applying to other academic programs
    - Demonstrate knowledge of advisor/advisee responsibilities.
    - Awareness of resources available and utilize services to maintain academic success
    - Articulate how personal interests, strengths, and weaknesses relate to the students' major and career choices.
    - Identify and use institutional, academic, and program resources to support/advance educational goals.
    - Utilize career/educational opportunities related to major/pathway of interest.
    - Understand the institution's academic policies and procedures as well as use of technological resources identified by the institution
    - Demonstrate knowledge of the transfer process, procedures, and how to participate in the reverse transfer program

Advising Research Examples

University of North Georgia

The concept paper incorporates data to advocate for the inclusion of a redesigned advising model as part of the most recent Quality Enhancement Plan.

Georgia College and State University

The two briefs summarize the institution's use of data to better understand advising challenges and develop recommendations that guide practices on campus to improve completion.

University of North Georgia QEP Topic Concept Paper: Advising

This paper outlines the developmental and intrusive advising at UNG that can provide students with the tools, skills, and support needed to achieve their academic goals. The proposed advising model includes the following components:

- Institutional resources including professional advisors, degree sequence maps, and availability of necessary number of course sections
- Predictive/intrusive advising using the EAB-type software that results in increased progression/graduation/retention rates and fewer excess credits
- Developmental advising by professional advisors where students acquire information, develop skills, and improve cognitive development

Current trends, best practices, supporting data

Current trends and best practices

Institutions of higher education, including University of North Georgia, have historically allocated the majority of support services to the most academically underprepared students; however, students with first year grade point averages (GPA's) below 2.0 have low percentage graduation rates despite extensive support. Greater opportunities for successful intervention with students who earn first-year GPA's between 2.0 and 3.0 have been largely ignored, even though small academic gains for this "murky middle" population correlate with meaningful gains in graduation rates. Additionally, promising students within this population are the most likely to leave college early, even though they are in good academic standing. (https://www.insidehighered.com/news/2014/09/10/maximize-graduation-rates-colleges-should-focus-middle-range-students-research-shows)

Current research highlights several student behaviors linked to the risk of attrition regardless of student GPA: enrolling in excess and often unnecessary credit hours, choosing majors late in the college career, performing poorly in courses critical for success in the program of study, and failing to gain admission into upper division major coursework and/or professional programs, such as nursing. To address these risk factors, best practices for academic advising are shifting focus away from generic interventions that over-rely on grade point averages to targeted interventions designed to address predicted risk profiles and support achievement of critical milestones and informed choices. The trend includes centralized advising services staffed with professional advisors trained in the institution's academic disciplines as well as in educational software and advising strategies that best support individual student needs. Faculty assume the role of mentors, helping students gain a better understanding of their majors and what it takes to be successful both within the institution and as part of a larger community.

Predictive analytics, degree maps and intrusive, on-time advising are essential components of advising programs that successfully use targeted strategies to enhance retention and graduation rates. Innovations in technology allow institutions to calculate the likelihood of graduation for every student based on their academic history as compared to past students. At-risk students are prioritized and organized according to course completions and grades determined to be predictive of success in their programs. Advisors are also provided with information regarding the student's likelihood of graduating in a wide range of majors offered by the institution.

Degree maps offer guided pathways through programs of study from matriculation to graduation to encourage student choices that are informed and deliberate. Students make the "big picture" choice of meta-majors, broad academic pathways in major areas such as business, science or social science. As students move toward specific majors, their pathways narrow and course requirements, course sequences, course availability by semester, and necessary credits are laid out for them. Students who enter college on generalized pathways and progress to specific degree program maps are less likely to waste credit hours or to enroll in credit hours that are "off track" for their programs of study.

Technology and degree maps form the basis for intrusive, on-time advising, which takes place when students fall off track in their programs of study. Each degree map contains critical milestone courses that must be completed on schedule to ensure timely progression. Professional advisors trained in the use of educational software can track milestone courses and be proactive in providing interventions when and where they are most needed. For example, when a key milestone course is not successfully completed, a software system can flag both the student and advisor and place an administrative hold on the student's account that requires a meeting. This system allows advisors to focus their efforts on students most in need of support services, including the population of "murky middle" students who have the best chance of persisting to graduation with only small academic gains.

Supporting data

National, state, and local data supporting the need for this type of advising model

State and national trends towards degree completion and performance-based funding have focused the spotlight on more intentional advising to support student progress. Data on Georgia students provided as part of the Guided Pathways to Success (GPS) initiative revealed that only 4.2% of associate degree-seeking and 13.0% of bachelor's degree-seeking students graduate on time while only 10.9% of associate degree-seeking and 49.4% of bachelor's degree-seeking student graduate at all. For part-time students, the data are even less encouraging. On average, students are taking 79 credits to complete a 60-credit associate degree and 134 credits to complete a 120-credit bachelor degree.

Currently, UNG retention and graduation rates for first-time, full-time, baccalaureate degree-seeking students exceed the USG sector average; however, subgroups such as Cadets and part-time students report lower performance.

On the UNG 2014 National Survey of Student Engagement (NSSE), UNG baccalaureate students reported a meaningfully lower level of agreement than USG students with the following statements:

- The academic advising I received on selecting, changing, or modifying my major field of student was helpful
- The academic advising I received on my post-graduation plans was helpful
- The academic advising I received helped me overcome academic difficulties

In September 2014, a survey was administered to the UNG community to identify the institution's interest in and support of select QEP areas. More than 1050 faculty, staff, and student responded to the survey. Of those that responded, 42% of faculty, 66% of staff, and 61% of undergraduate students rated "develop advising models that support student success" as "critically important to improving student learning." Faculty comment themes included moving the advising responsibility to professional advisors, enabling students to be independent in advising, support of intrusive advising techniques, and improving class availability. In a separate survey administered to faculty during fall 2014 assessing, in part, the effectiveness of the Advising Center, over half of faculty was in favor of hiring professional advisors for UNG academic departments.

Data on success at universities using similar types of advising models

Data from other universities implementing aspects of guided pathways and intrusive advising approaches has yielded success:

Florida State University: Degree Maps and other strategies to increase graduation have decreased excess credits and increased graduation rates.

- Since starting degree maps, FSU has cut the number of students graduating with excess credits in half.

- In 10 years, FSU's graduation rate for all students has increased 12%, to 74%. The graduation rate for African Americans has increased to 77%, for first-generation Pell students to 72%, and for Hispanic students to more than 70%.

Arizona State University: The eAdvisor System (software supporting major maps and intrusive advising for "off track" students) has boosted retention and success.

- First-time, full-time freshman retention rates have climbed to 84%.
- 91% of all students deemed to be on track in their programs, up from 22% three years ago.

Georgia State University: Degree maps and intrusive advising have boosted graduation rates by more than 20 percentage points in the last 10 years.

- Pell students (52.5%), African American (57.4%), and Hispanic students (66.4%) now graduate at higher rates than the overall student body.
- More Bachelor's Degrees are conferred to African Americans at Georgia State than any other US University. (Jones, S. (n.d.). GPS: A College Completion Game Changer. Retrieved from http://completecollege.org/gps-institute/)

How the topic relates to the institutional mission and strategic plan

The mission of UNG includes a focus on "providing a culture of academic excellence in a student-focused environment" that "develops students into leaders." The multifaceted advising model considered here provides students with the information, tools, and support to navigate their academic paths in an informed and highly personalized manner. Goal 2 of the UNG Strategic Plan is "Enhance leadership and the development of the whole person." Predictive analytics in combination with intrusive and developmental advising helps students identify academic and career goals early, create academic plans guided by course performance, avoid unnecessary courses, and develop the skills to take control of their academic careers. Students are then equipped to become self-directed decision-makers and leaders in their educational and career paths, now and in the future.

The role of the topic to improving student learning, benefits to the institution/students

Advising strategies that include predictive analytics, degree sequence maps and critical milestone courses help students become self-directed decision-makers who assess information and make deliberate choices about their educational careers. Advisors provide the tools with which students learn to critically think about data. Risk assessment allows professional advisors to guide students as they learn to choose majors and consider career paths. Sequenced degree maps with attending course rotation schedules help students become independent learners in charge of their own academic progression. When students fall off track, intrusive, on-time advising encourages them to self-assess in light of predicted success. Students learn to base educational goals on informed choices and to revise goals when appropriate.

When advisors intervene with students who, regardless of GPA, fail to complete critical milestone courses for their programs of study, success strategies become extremely individualized. In turn, individualization of approach supports increased student motivation to learn and apply academic strategies. Through advising sessions, students gain new skills, such as recognizing when to seek outside help, forming study groups, and gaining confidence to ask questions in class, that apply directly to their personal critical milestone courses.

For students, the rewards inherent in successful advising strategies are tangible and lifelong. Earning a college degree, graduating on time, saving thousands of dollars in tuition and fees, avoiding excess credit hours, and beginning a career sooner all contribute to increased earnings over the course of a lifetime. In addition, skills such as self-direction, informed decision-making, and critical thinking are translatable to success in endeavors outside of the educational environment.

For the University of North Georgia, the need to retain and graduate students has never been greater. There is a high economic cost to the institution associated with student attrition. Additionally, national enrollment predictions show the rate of undergraduate enrollment slowing over the next decade, so new students can no longer be used to "fill the gap" when other students drop or fail out. Performance-based funding is also becoming a reality in the state of Georgia, and Governor Deal's *Complete College Georgia* initiative challenges University System of Georgia (USG) institutions to produce an estimated 250,000 additional graduates in upcoming years. Successful advising strategies that increase retention and graduation rates will address these issues and benefit UNG financially and secure our place as a leading USG institution.

In assuming the role of mentors, faculty at UNG will be relieved of high advising loads that are extremely difficult to manage in light of teaching, research, and other service responsibilities. A substantial increase in professional advisors will allow faculty to devote more time to grant opportunities and research, thus enhancing the academic reputation of the institution nationally. Students will benefit from increased accessibility of advising services, highlighting UNG's student focused mission and producing graduates who reflect back on their time at UNG as crucial to the development of their whole person.

Resources needed to implement the topic

Comprehensive educational software that pulls together student risk profiles, degree maps, course milestones, and opportunities for targeted intervention is critical for advising efforts that enhance student retention, progression, and graduation. Two software platforms, Educational Advisory Board and Civitas Learning, are examples of software that use predictive analytics to gain insight into the challenges and opportunities students face. Both programs support informed and deliberate decision-making, guided major pathways, and intrusive, on-time advising for students who fall off track in their programs of study.

The practice of professional advising at UNG must grow substantially in order to take full advantage of predictive analytics, especially as faculty assumes the role of mentors. Current trends in supportive advising are not limited to the lowest GPA-earning students, and additional professional advisors are necessary to facilitate student understanding of the expanded data technology provides. Advisors must interpret and make use of relevant data within a developmental advising model, acting as coordinators of a learning experience that results in the exploration of life and career goals, choice of major program, and successful academic progression. Increased professional staff is also necessary for the organization of advisors into clusters serving academic disciplines offered by the institution as well as special populations, such as dual enrollment and undeclared students.

Course availability, and the corresponding need for faculty to teach in-demand courses, is also required to implement an advising program that promotes informed choices and encourages student progression. Degree sequence maps and critical milestone achievement rely on course availability and information about semester course rotations. Science meta-major pathways, for example, require students to enroll in appropriate math and science courses during their first semesters of attendance in order to stay on track in their programs of study.

Methods by which progress could be monitored and improvements measured

An advising model that includes both prescriptive and developmental components can be assessed in multiple ways. The purpose of this approach is to enable students to identify degrees in which they can be successful and support their progression. Examples of institutional measures assessed on an annual basis include:

- Decrease in average number of non-degree related credits
- Increase in progression rates
- Increase in graduation rates

- Increase in retention rates
- Increase rate of students achieving selected academic benchmarks

Several of these rates are already collected for reporting purposes while others can be collected by the Office of Institutional Effectiveness using the Banner SIS database. These data may also be collected for subgroups if the model is rolled out to select populations initially or with select components.

The developmental aspects of this model are centered on student learning outcomes related to information, skills, and cognitive development. Examples of learning outcomes might include:

Information

- Understand degree requirements
- Understand benefits of "15 to Finish"
- Awareness of student support services, such as tutoring

Skills

How to:

- Register/withdraw from courses
- Navigate Banner
- Create an academic plan/schedule
- Limit excess credits
- Overcome obstacles of class difficulty, financial issues, feelings of isolation
- Plan ahead
- Meet key academic milestones

Cognitive Development

- Articulate academic and career goals
- Explain how a course is relevant to a major and a major to a career
- Identify a major earlier in academic career
- Identify when a course or major is not working

These can be collected through an observational instrument developed for advisors in addition to student completion of a normed advising survey that focuses on developmental learning outcomes. An example includes the Academic Advising Inventory (AAI) created by the National Academic Advising Association (NACADA).

15 to Finish: A Good Fit For Georgia College?

Eric Braun and Dr. Chris Ferland, *GCSU Office of Institutional Research and Effectiveness*

The nationwide "15 to Finish" movement intends to increase collegiate graduation rates by encouraging academic momentum vis-a-vis a higher course load. Research has found that a higher course load ensures students are more engaged in academics and are, therefore, more likely to be successful and graduate. OIRE conducted a statistical study to predict what the effect of a conservative implementation of "15 to Finish" would have on Georgia College students who took lower course loads independent of academic ability and other confounding student characteristics. The study suggests that approximately 11% of students who took lower course loads and did not graduate within six years would have graduated if "15 to Finish" was implemented. However, the marginal increase to the 6 year graduation rate would amount to less than one percent as the majority of non-completing students transfer rather than fail to graduate.

Background

The "15 to Finish" campaign has gained momentum in recent years, becoming a centerpiece retention and graduation initiative of higher education institutions nationwide. Within the University System of Georgia, a number of institutions have been enthusiastic supporters of "15 to Finish", including the University of North Georgia, Georgia Perimeter College and East Georgia State College. "15 to Finish" programs broadly aim to increase graduation rates by encouraging academic momentum vis-a-vis a higher course load. While it is obvious that taking units is requisite for graduation, the insight of "15 to Finish" is that a course load of at least 15 units may keep at risk students engaged in their academics and thereby increase the likelihood of their graduation. Research into the effect of academic momentum has largely corroborated this phenomena [1, 2, 3, 4, 5, 6, 7, 8, 9]. The purpose of our statistical study is to assess the degree to which a "15 to Finish" campaign would benefit Georgia College students currently taking less than 15 units in a majority of enrolled semesters.

Methods

Our study utilizes a statistical approximation of a randomized trial known as propensity score analysis. Using the 2007 class of first time full time (FTF) freshman, we modeled the change in the 6 year graduation resulting from taking more units than the students actually took. We controlled for confounding characteristics such as academic ability and demography. The goal of using this approach is to reveal the independent effect of taking more units on the six year graduation rate. We used 14 units as our treatment baseline, following the recommendation of the Academic Advising Center; in many cases, 14 units can be essentially equivalent to 15 units in terms of normal progress toward graduation at Georgia College.

Two treatment scenarios were modeled. The first treatment model assessed the effect of all students taking at least 14 units in 75% of their enrolled semesters. The second treatment model assessed the change in graduation rate if students who took at least 14 units in 50% of their enrolled semesters had instead taken at least 14 units in 75% of their enrolled semesters. The former treatment imagines a full population application of "15 to Finish", while the latter assesses the effect on only academically engaged students.

The model specifically controlled for academic ability (SAT scores, high school GPA), major, major changes, gender, race, HOPE scholarship and Pell grants. Students who transferred, double majored or had accommodations were left out of the analy-

Scenario 1: *Full Cohort*

Grouping	Percent Change	Additional Graduates	Significant?
Full Population	11%	10	Yes
Arts & Sciences	11%	8	Yes
Business Col.	12%	2	No
Nursing Col.	4%	0	No
Education Col.	0%	1	No
Men	7%	4	Borderline
Women	9%	6	Yes
HOPE	6%	6	Yes
No HOPE	8%	4	No
PELL	6%	3	Borderline
No PELL	8%	7	Yes
STEM Major	9%	2	Yes
Not STEM Major	9%	8	Yes

Scenario 2: *>50% 14 Unit Semesters*

Grouping	Percent Change	Additional Graduates	Significant?
Full Population	11%	8	Yes
Arts & Sciences	10%	6	Yes
Business Col.	8%	1	No
Nursing Col.	0%	0	No
Education Col.	0%	0	No
Men	10%	3	Yes
Women	8%	4	Yes
HOPE	6%	3	Yes
No HOPE	8%	2	No
PELL	6%	1	No
No PELL	10%	5	Yes
STEM Major	13%	2	Yes
Not STEM Major	11%	6	Yes

sis since these students have fundamentally different behavior than the other members of the 2007 FTF freshman cohort. After these exclusions, 715 students out of the full 1198 cohort were ultimately included in the analysis.

The propensity score analysis was conducted in R using the MatchIt package. Slightly different models were used depending on each subgroup characteristics and data limitations. Missing data was imputed with a bootstrapped EM algorithm using the Amelia package. Bootstrapped BCa confidence intervals were calculated using the boot package.

Results

The results for the two scenarios below are split into two tables. The first table includes the predictions for the change in the six year graduation if the students had taken 14 or more units in 75% or more of enrolled semesters. The second table includes the predictions for the change in the six year graduation rate if students who had taken 14 or more units in 50% or more semesters took 14 or more units in 75% or more of enrolled semesters. The "significance" columns in the tables refer to whether we can be 95% or more confident that the predicted value is greater than 0.

In the first scenario, 10% of the 98 out of 715 students who did not graduate within 6 years would have graduated if they took 14 or more units in 75 % or more of their semesters. This change would increase the overall 6 year graduation rate in this subpopulation of students from 86.3% to 87.7%. Smaller sample sizes make the estimates for the narrower classifications less precise, but the estimates are suggestive of their being certain groups that would benefit more from the treatment than others.

In the second scenario, we find a similar 11% decrease in students who would not graduate in 6 years. The similar behavior of the full cohort and the more academically engaged subpopulation suggests that the policy of taking 14 or more units should not only be targeted to those who are consistently taking less than 14 units a semester as even higher performing students put themselves at greater risk of not graduating if they enroll in fewer than 14 units.

Recommendations

Our headline recommendation is that students taking 14 or more units per semester should be a priority. Potentially decreasing the population of FTF freshman who do not go on to graduation by 11% is large percentage-wise even though it is not large numerically (11 in this sample). The small numerical number stems from the fact that about 85% of FTF freshmen who do not transfer already graduate, so even a significant reduction in the 15% of students who do not graduate is still just a fraction of 15%. The following implementation strategies for a "15 to Finish" initiative are largely drawn from existing efforts at other universities that have been found to be successful.

Conduct an awareness campaign of the benefits of enrolling in 14+ units

The University of Hawai'i System, after identifying that many freshman failed to complete 30 units within the first year, found that, controlling for academic preparation and demographic characteristics, those students who at least enrolled in 15 or more units a semester were more academically successful[10, 11]. The decision was made to make taking 15 units the institutional norm in the University of Hawai'i System. A massive public awareness campaign was conducted that promulgated the importance and benefits of taking 15 units per semester. Academic maps for each major were also created to make it clear to students how to structure a 15 unit schedule. Over the first three years, the number

of freshman taking 15 units per semester increased from 14.8% to 41.5%. Georgia College could undertake a similar campaign to further ingrain into students,faculty and staff that 14 units per semester should almost categorically be expected.

Mandatory advising meeting and/or approval for students to enroll in less than 14 credits

Apropos of the benefits of institutionalizing a culture of 14 or more units, it may be beneficial for advisors to be involved in a students decision to take less than 14 units. This would both emphasize the expectation of taking 14 or more units to the students and advisors and give advisers a chance to provide direction and support to students who's circumstances have lead them to consider taking less units.

Incentivize higher unit enrollment through financial aid

Financial aid could be a strong motivator for enrolling in 14 or more units. The University of New Mexico's VISTA scholarship, $1000 per semester for four semesters, requires students to enroll in 15 units. Research has found that recipients of the VISTA scholarship are more likely than similarly academically able students to attempt and complete 15 units per semester with no significant negative impact on academic performance [12]. Similar results have been observed for West Virginia's PROMISE Scholarship which provides full tuition and fees for up to four years at public two- and four-year colleges in West Virginia for students. PROMISE scholars must also enroll in 15 or more units. Research suggests the PROMISE scholarship, like the VISTA scholarship, independently improves graduation rates [13].

Given this evidence, there is reason to believe the HOPE and other state or institutional scholarships should require or provide additional support for enrolling in 15 units or more units. While changing the criteria for HOPE and other state scholarships is not something Georgia College can do unilaterally, Georgia College can advocate for the change within the University System of Georgia community and the public arena.

Not for students with significant competing life responsibilities

Research suggests students who have to work over 30 hours a week or have other major life obligations outside of academics do not benefit from enrolling in 15 credits[14]. Any implementation of "15 to Finish" needs to be conscious of these factors in order to prevent these students from becoming less academically successful due to an untenable schedule of responsibilities.

Not a solution for substantially increasing the 6-year FTF freshmen graduation rate

The predicted 11% decrease in the non-graduation rate, while a significant percentage-wise reduction, is small in absolute terms since about 85% of students who stay at Georgia College already graduate within 6 years. While moving the graduation rate from approximately 85% to 86.5% is meaningful, it will not have a large impact on Georgia College's FTF freshman completion rate. Nearly three times as many non-completers transfer to other institutions as drop out. Therefore, in order to significantly increase Georgia College's overall 6-year graduation rate, the number of transfers out of the college would have to be reduced. "15 to Finish" and other policies intended to help students graduate cannot be relied upon to have a substantial impact on the overall 6-year graduation rate.

References

[1] Clifford Adelman. Answers in the tool box. academic intensity, attendance patterns, and bachelor's degree attainment. 1999.

[2] Clifford Adelman. Principal indicators of student academic histories in postsecondary education, 1972-2000. *US Department of Education*, 2004.

[3] Clifford Adelman. Moving into town–and moving on: The community college in the lives of traditional-age students. *US Department of Education*, 2005.

[4] Clifford Adelman. The toolbox revisited: Paths to degree completion from high school through college. *US Department of Education*, 2006.

[5] Paul Attewell, Scott Heil, and Liza Reisel. What is academic momentum? and does it matter? *Educational Evaluation and Policy Analysis*, 34(1):27–44, 2012.

[6] Lutz Berkner, Shirley He, and Emily Forrest Cataldi. Descriptive summary of 1995-96 beginning postsecondary students: Six years later. statistical analysis report. 2002.

[7] C Dennis Carroll. College persistence and degree attainment for 1980 high school graduates: Hazards for transfers, stopouts, and part-timers. survey report. 1989.

[8] Peter M Crosta. Intensity and attachment: How the chaotic enrollment patterns of community college students relate to educational outcomes. *Community College Review*, page 0091552113518233, 2014.

[9] Alexander C McCormick and C Dennis Carroll. *Credit production and progress toward the bachelor's degree: An analysis of postsecondary transcripts for beginning students at 4-year institutions*. DIANE Publishing, 1999.

[10] J. Itano. 15 to finish. Presentation given at the Indiana Commission for Higher Education Strengthening Guided Pathways to Student Success Summit, 2013.

[11] University of Hawai'i System Instiututional Research and Analysis Office. Impact of enrolling in 15 or more credits on selected performance measures: First-time freshmen at the UH four-year campuses. `http://15tofinish.com/reference/15_to_Finish_4-Yr_Combined_Report-September_2013.pdf`, 2013.

[12] Cynthia Miller, Melissa Binder, Vanessa Harris, and Kate Krause. Staying on track: Early findings from a performance-based scholarship program at the university of new mexico. *Staying on Track: Early Findings from a Performance-Based Scholarship Program at the University of New Mexico, Cynthia Miller, Melissa Binder, Vanessa Harris, and Kate Krause*, 2011.

[13] Judith Scott-Clayton. On money and motivation a quasi-experimental analysis of financial incentives for college achievement. *Journal of Human Resources*, 46(3):614–646, 2011.

[14] D. Monaghan and P. Atwell. Academic momentum at the gate: Does first-semester credit load affect postsecondary completion? Presented as the the meeting of the American Education Research Association, 2014.

Machine Learning in Institutional Research:
Random Forest Model of Undergraduate Transfer Risk

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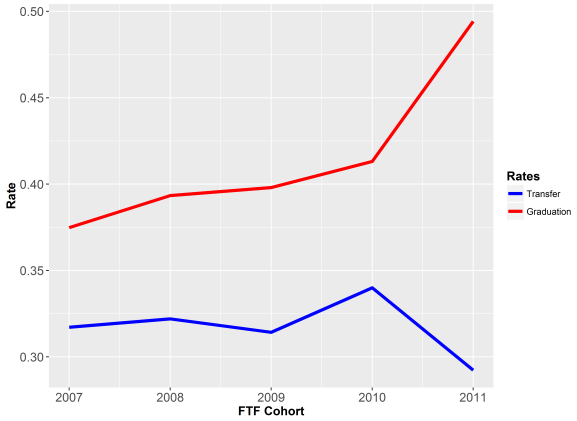
Machine learning comprises a set of cutting edge computational tools for data driven decision making. While machine learning has been widely adopted in industry, it has yet to become a staple of institutional research. The Office of Institutional Research and Effectiveness has developed a machine learning model that predicts student transfer and graduation in order to demonstrate that machine learning can provide insight into an issue of primary importance to higher education administrators. Our model predicts the likelihood a student will transfer or graduate in their next term of enrollment with 88% and 62% accuracy respectively; the predictive strength of the model, especially in regards to transfer risk, yields a powerful tool for both assessing and developing interventions to improve student success. Recommendations for initial implementation of the model in decision making include uses in Academic Advising, Academic Department Chairing and Enrollment Management

I. Background

Machine learning methods have become a tool of choice for leveraging data to assist in decision making. Machine learning has found widespread usage in industry. Examples of machine learning's diverse applications include predicting consumer churn, returning internet search results and identifying fraudulent financial transactions. In order to demonstrate how machine learning can be applied in the higher education setting, the GCSU Office of Institutional Research and Effectiveness has developed a random forest model, a robust machine learning method, that predicts student transfer and graduation risk. The ability to predict retention and graduation as well as assess associated factors allows for more informed development and assessment of retention and graduation interventions.

The current trend in GCSU's four year graduation and transfer rates is positive. The four year graduation rate increased from 39% to 49% from the 2009 to 2011 first time full time freshmen cohorts; the four year transfer rate for those same cohorts decreased from 32% to 29% over the same period. While these trends are positive, the likely result of a number of concurrent interventions such as the broadening of summer course offerings and expansion of the Supplemental Instruction program, there remains significant room for improvement.

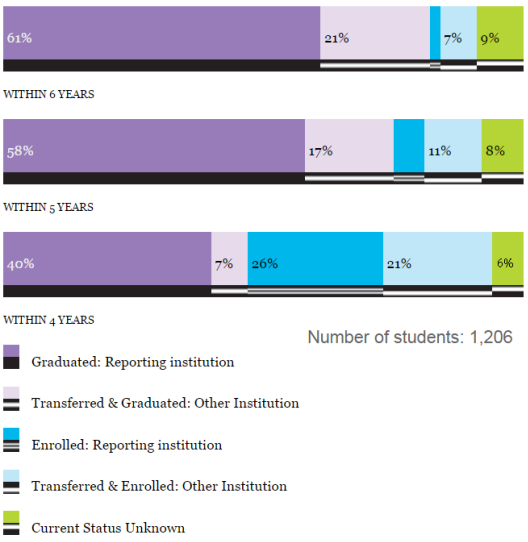
4 Year Graduation and Transfer Rate
2007 - 2011 Trend



If we examine the six year outcomes for the 2009 cohort, we see that over 61% of students graduated from GCSU with another 2% still enrolled. A full 28% either graduated or was enrolled at another institution, while only 9% of the 2009 cohort had stopped out of higher education altogether. Proportionately, retaining more transfer students would have a more significant impact on the graduation rate than retain-

ing more stopouts. Transfers both represent a much greater proportion of the cohort and 75% of transfers subsequently went on to graduate from their transfer institution.

FTF 2009 Cohort Retention and Graduation



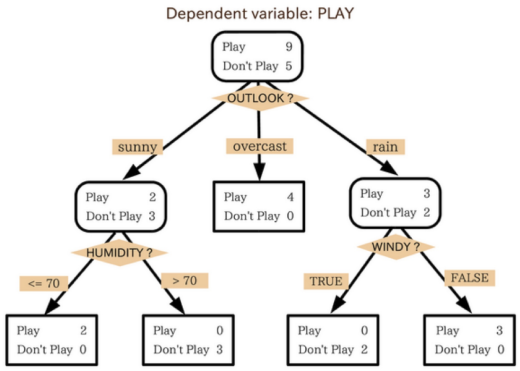
National Student Clearinghouse, 2015

It is difficult to discern what factors motivate the transfer and graduation trends. Many factors changed over the academic tenure of the 2009 to 2011 first time full time freshmen cohorts, including but not limited to new academic support programs, changing student characteristics, and different faculty. In order to better isolate the relationship between the many possible factors at play and predict the future behavior of students, a "random forest" machine learning model was developed and applied to available institutional data on students, faculty and college programs.

II. Methods

The data used for the random forest machine learning model consisted of 8,691 first-time full-time undergraduates, comprising 97% of the full 2007 to 2014 first-time full-time undergraduate cohorts. The data included 5,400 females and 3,291 males, and 7,540 Caucasians, 436 Latinos, 345 African Americans and 370 of other ethnicities.[1] The institutional portion of the data included demographic, academic performance, course, faculty, and financial characteristics. Data from several college programs were able to be included, including the Career Center and the GIVE Center. US Census data on student's home census tracts were also included.

Example: A Decision Tree



CitizenNet, 2012

The particular machine learning model used, random forests, have proven to be amongst the most robust methods available. Machine learning methods, in general, use observed data to 'train' a model to predict a future outcome, though they differ greatly in the approach used to train and predict. The intuition behind the random forest method begins with a basic decision tree. For example, imagine one was at the park and had to determine whether the weather will remain fair enough to play a game of football. One could go through a set of variables, such as cloud cover, precipitation humidity and wind, to make the decision as seen in the adjacent figure. It is difficult, however, to determine a priori which variables should be included and at what point in the tree. Random forests address this issue by repeatedly selecting a random subset of variables from all the variables available, selecting a random subset of observed data from which to train, and constructing a tree based on a chosen splitting rule. When predicting a new outcome, each constructed tree gets a vote, with the majority vote yielding the ultimate prediction.

In the case of predicting student transfer and graduation risk, we chose to use a random forest with a competing risks type splitting rule [2]. Transfer and graduation are event history outcomes, and are thus suited to the event hazard formulation of the splitting rule.

III. Results

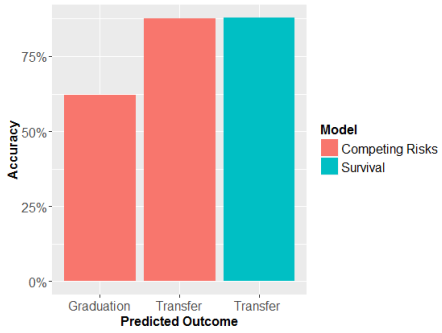
The model was found to predict transfer and graduation with 88% and 62% accuracy respectively on

[1] See GCSU's 2015 Factbook and OIRE's dashboards for greater cohort data detail.

[2] R package 'rfsrc' implementation of competing risks random forests

average. These accuracies were validated both using a random subset data to train and the excluded data to test, as well as predicting the 2014-2015 academic year outcomes with the rest of the data being used to train the model. For methodological comparison, the same data were used to train a survival random forest targeted at predicting transfer outcomes. The considerably higher error rate in predicting graduation is due to two factors. First, in order to predict whether a given student graduates correctly, the model must also predict whether that student transferred since transferring precludes graduation. Second, transferring and graduating students are similar in their characteristics in the model data. It is hoped with additional data and model development the graduation prediction accuracy will be substantially improved.

Model Accuracies



Top 10 Predictors of Transfer Risk

Factor	Relative Importanc
HOPE Scholarship	1.00
Trimester	0.92
Summer Terms Attended	0.86
Matriculation Year	0.71
Loans	0.58
Culm. Credit Hours Earned*	0.21
Full Time Faculty Taught Courses* %	0.15
Course Registration Timeliness*	0.09
Ave. Term Units Withdrawn*	0.07
Ave. Term Units Taken* %	0.07
*: Lagged Variable	

Top 10 Predictors of Graduation Risk

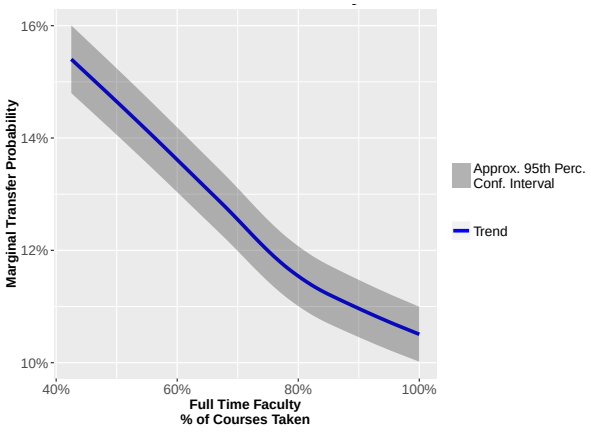
Factor	Relative Importance
Trimester	1.00
Merit Scholarship	0.35
Matriculation Year	0.33
Summer Terms Attended	0.29
Ave. Units Withdrawn*	0.23
Culm. GPA*	0.23
Career Center Event Attendance*	0.21
Course Registration Timeliness	0.16
Ave. Term Hours Attempted*	0.15
Ave. Difficulty of Courses Taken*	0.08
*: Lagged Variable	

The random forest model was used to produce three sets of results that exhibit the variety of information that can be gleaned from the methodology: variable importance, marginal variable impact, and cohort identification. The model could also notably be used to predict outcomes for individual students. A full list of the model variables organized by outcome and variable importance used in the model can be found in the appendix.

Variable importance measures how predictive a given variable is on the outcome. It should be noted that variable importance does not have the same interpretation as a regression coefficient; variable importances are not the individual marginal effects of a linear combination of variables. Rather, variable importance is a measure of the influence of a variable on the random forest. In order to facilitate an intuitive interpretation, variable importances here are calculated relative to each other. Accordingly, the most important variable has a value of 1 with the others listed in decreasing relative proportion.

The two included variable relative importance tables can be used as starting points for developing interventions. The random forest model does not provide an explanation for how these variables tell the story of transfer and graduation risk, only that these variables have been found to be important. Further investigation in the form of field research would be required to develop a theoretical explanation.

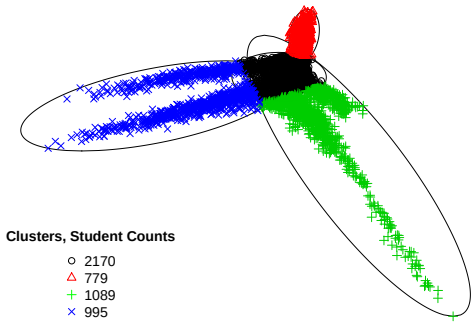
First Year Transfer Risk
% Courses Taught By Full Time Faculty



The random forest model can be used to estimate

the marginal effect of the variables. We have found, for example, that freshmen who have taken 100% of their courses with full time faculty have approximately 1/3 lower percent chance of transferring in the following year than freshmen who have taken only 40% of their courses with full time faculty. The rate of decrease in transfer probability is relatively constant as the percent of courses taught by full time faculty increases, suggesting that there is value in increasing the proportion of courses taught by full time faculty as close to 100% as possible.

FTF Student Clusters
Graduates and Transfers, Fall 2008 - Fall 2015



Another application of the random forest model is cohort identification. The cluster plot visualizes four distinct clusters [3] of students based on all the factors included in the random forest models. Student profiles could be developed based on the characteristics of each student cluster to guide the creation of interventions specific to the unique needs of student these four student sub-populations.

IV. Recommendations

The breadth and accuracy of the possible insights from the random forest model sketch the potential machine learning methods have to assist in furthering university priorities. The implementation of these models, however, requires top down support in order to motivate machine learning assisted decision making and bottom up belief in the change being worthwhile. Wider institutional support for the use of machine learning methods in decision making would thus be facilitated if there is a tangible example of successful application. Given OIRE has already developed a random forest model for transfer and graduation behavior, OIRE could collaborate with appropriate entities such as the Center for Student Success and Enrollment Management to align the model analyses to the needs of current decision making or to assist in the implementation of a current intervention. To this effect, an outreach effort was conducted, resulting in interviews with Academic Advising, an academic department chair and Enrollment Management. The following recommendations for a first application of the model emerged from these conversations.

IV.I. Academic Advising: Student Risk Flags

Advisors have a limited amount of resources to devote to each of their advisees. In addition, advisors have many possible interventions they might to suggest to a student depending on their situation, such as the Learning Center for those struggling academically to the Career Center for those without clear direction in their studies. The model could help assist advisors by providing two different indicators for each of their advisees, one for graduation risk and one for transfer risk. The indicators could be as simple as a green/yellow/red - high/medium/low risk flags or as complex as a specific percentage likelihood and a list of top risk factors for each student. The advisor could then use these indicators, along with all other available information and their own expertise, to determine which students are most likely to benefit from an intervention to improve their chances of graduating and/or not transferring. The model is not meant here to be the final word but, rather, a data-driven perspective that could help highlight in need students.

IV.II. Academic Department Chairs: Declared Majors Intelligence

Department chairs, as advocates for their departments, need to be aware of the performance of their department's majors to make informed decisions about the deployment of academic resources. The student level predictions of graduation and transfer risk from the models could be aggregated up to the department level so department chairs could get an assessment of the likely future success of their department majors as well as a list of the top risk indicators for the full population of a department's majors. This information would then give depart-

[3] The clusters were created by applying pam clustering (a robust variation of k-means clustering) to the proximity matrix of the random forest.

ment chairs a data driven view into the challenges facing their department majors.

IV.III. Enrollment Management: Application Yield

The model could be re-purposed for other uses. With some modification to the baseline data and methodology, the model could be transitioned into a tool that can assess the risk of a application to Georgia College yielding. Given that Georgia College's prestige is contingent on a high percentage yield of admitted students, greater accuracy in this area would be a boon to the entire institution. An indicator for each application could be offered in the same fashion as the indicators for the students: something as simple green/yellow/red - high/medium/low risk flags or as complex as a specific percentage likelihood and a list of the top risk factors. Enrollment Management could then use the indicator as an aid in making decisions on specific applications and prognosticating the likely overall yield and class size.

IV.IV. Appendix: Full Model Relative Variable Importance

Relative Variable Importance, Transfer Risk

Variable	Relative Importance
Loan	1.00
Trimester	0.64
Merit Scholarship	0.63
Summer Terms Attended	0.53
Matriculation Year	0.34
Culm. Credit Hours Earned*	0.11
Full Time Faculty Taught Courses* %	0.10
Ave. Term Hours Attempted*	0.06
Course Registration Timeliness	0.05
Minority Faculty Taught Courses %	0.05
Ave. Units Withdrawn*	0.04
Career Center Event Attendance*	0.04
Ave. Difficulty of Course Taken*	0.03
Ave. GIVE Center Hours*	0.03
Needs Based Scholarship	0.03
Major	0.03
Major Change Count*	0.02
College	0.02
Career Center Appointments*	0.02
Culm. GPA*	0.02
High School GPA	0.01
Female Faculty Taught Courses	0.01
Gender	0.01
AP Credits	0.01
Median Home Price, Home Census Tract	0.01
Aggregate Student Income	0.00
Secondary Edu. Attainment, Home Census Tract	0.00
SAT Score	0.00
App. Submitted Pre-UGA Deadline	0.00
Historical High School GPA	0.00
Ethnicity	0.00
Undecided Major	0.00
Population Density, Home Census Tract	0.00
Parental Edu. Attainment	0.00
*: Lagged Variable	

Relative Variable Importance, Graduation Risk

Variable	Relative Importance
Trimester	1.00
Merit Scholarship	0.35
Matriculation Year	0.33
Summer Terms Attended	0.29
Ave. Units Withdrawn*	0.23
Culm. GPA*	0.23
Career Center Event Attendance*	0.21
Course Registration Timeliness	0.16
Ave. Term Hours Attempted*	0.15
Ave. Difficulty of Courses Taken*	0.08
High School GPA	0.08
Gender	0.07
Full Time Faculty Taught Courses*	0.07
Culm. Credit Hours Earned*	0.05
College	0.05
Major	0.05
Ave. Give Center Hours	0.05
AP Credits	0.04
Loan	0.03
SAT Score	0.02
Female Faculty Taught Courses	0.02
Career Center Appointments*	0.02
App. Submitted Pre-UGA Deadline	0.02
Female Faculty Taught Courses	0.02
Needs Based Scholarship	0.02
Ethnicity	0.01
Historical High Sschool GPA	0.01
Seconday Edu. Attainment, Home Census Tract	0.00
Median Home Price, Home Census Tract	0.00
Undecided Major	0.00
Parental Edu. Attainment	0.00
Major Change Count*	0.00
Aggregate Student Household Income	0.00
Population Density, Home Census Tract	0.00
*: Lagged Variable	

Enrollment Trends Examples

University of Georgia

The Sankey diagram developed by the Office of Institutional Research is used to visually display major changes by one cohort of students through their four-year degree progression. With this information, advisors can gain some understanding of major change patterns and possible ways to expedite the process of finding the right major.

Valdosta State University

The comparison report is provided regularly to institution leaders to monitor and quickly address enrollment changes by major.

Efficient Curricula: The Complexity of Degree Plans and Their Relation to Degree Completion

Gregory L. Heileman, Terry Babbitt, Chaouki T. Abdallah, and Michael J. Dougher

Introduction

Institutions of higher education are under mounting pressure to improve their retention and graduation rates. This is driven by numerous factors, including the desire to improve institutional characteristics for rating purposes and the increasing trend of states tying institutional funding to student outcomes, as well as the fact that a bachelor's degree has become an increasingly necessary prerequisite for success in the workplace—creating a moral imperative for colleges and universities to graduate the students they admit. Given these pressures, universities are collecting unprecedented amounts of information related to student performance and progress and applying ever more sophisticated analytical techniques in efforts to determine the most important factors that contribute to attrition and persistence.

The first studies in this country that were closely related to what we today call student retention were introduced in the 1930s as a result of the growing diversity of college opportunities available, including the emergence of selective institutions and the advent of the junior college. This was a time when John McNeely coined the term "student mortality" in his in-depth 1938 bulletin that collocated issues of timing and cause of student attrition (Berger and Lyon 2005). The nation then turned to matters of world war, both hot and cold, and it was roughly thirty years before Astin and others picked up the subject matter. Tinto's (1975) integration model led to the modern era of student persistence research; he cast the problem as "a longitudinal process of interactions between the individual and the academic social systems of the college during which a person's experiences in those systems . . . continually modify his goal and institutional commitments in the ways which lead to persistence and/or varying forms of dropout" (Tinto 1975, 94). Kuh et al. (2010) looked more closely at the institutional conditions—such as the policies, programs, practices, and cultural properties—that lead to student success. They found that the most important factor is *student engagement*, noting that it sits at the intersection of student behaviors and the aforementioned institutional conditions. Furthermore, unlike most of the other factors that determine student success (e.g., previous preparation, socioeconomic status, etc.), student engagement is a factor that can be influenced by the institution. In efforts to improve student success, many institutions took these lessons to heart and worked to increase the amount and quality of the student support services they provide (Kuh et al. 2006; Tinto 1987). For instance, many schools began to more rigorously and intentionally track the academic progress of their students, the extent to which they participate in educationally purposeful activities, the level of satisfaction with their campus experiences, and the added value (in terms of knowledge and skills acquired) of the entire undergraduate experience (Moore and Shulock 2009). Some institutions reported significant increases in student success as a result of their efforts, but with others the benefits were much more limited. An important trend, however, is that this work is now more commonly being driven by high-quality inquiries and analyses, often through studies with multi-institutional scope, in efforts to more accurately determine the "conditions that matter" for student success in college (Kuh et al. 2010).

The most fundamental measure of student success is degree attainment, and it is not uncommon to find heartwarming accounts of students who earn a degree in spite of the fact that multiple indicators gave them little chance of success—they succeed in spite of the odds. For these students, indeed for any student, the simple cold facts are these: if they are able to successfully navigate all of the requirements associated with a degree program, they earn the degree, end of story. In fact, at a very basic level it makes sense to think of all of the success-driven interventions mentioned above in terms of their ability to facilitate the movement of students through the individual requirements associated with degree programs. Indeed, in the end, the efficiency with which a student may progress through these requirements is what matters most. Certainly, creating institutional conditions "that matter" will facilitate student progression, but there may also exist structural conditions within the curriculum itself that limit progress independent of any success initiatives.

Degree attainment is generally tightly prescribed, requiring a student to accomplish a very specific set of goals laid out as a curriculum. This paper addresses student progress at this most basic level by investigating the structural properties of individual curricula to arrive at a measure of curricular efficiency. We contend that the role curricular efficiency plays in student academic success is more important than many realize and should be taken into account by those responsible for designing university curricula as well as support services. The remainder of this paper describes the efforts underway at the University of New Mexico (UNM) in this regard. We began studying curricular efficiency at UNM two years ago. Initially, we used Sankey diagrams to better understand how students flowed through the curricula at UNM during the previous seven years. This allowed us to counter numerous myths related to student progress at UNM and led to our study of the curricular efficiency of particular degree plans, along with the generation of curriculum graphs for these programs. We created graph-theoretic metrics for these degree plans and then compared them to those at numerous other four-year institutions. After accounting for student preparation, along with the graduation rates at these institutions, we found that the efficiency of a curriculum plays a significant role in determining the success rate of students at these institutions.

Visualizing Student Flows

Rather than studying the individual path a particular student takes toward graduation, which may not reveal the larger structural impediments related to the institution, we were interested in studying how particular populations of students flowed through the university system. Thus, we created visualizations of student cohort flows, overlaid on the structure of UNM, with the goal of uncovering deeper insights about the institutional factors that influence student success, or lack thereof. The visualizations resulting from this study, known as Sankey diagrams, are described below. We have found them helpful because they demonstrate how students flow through the UNM system in an intuitive and useful way. These flows make apparent the relative volume of students flowing through a program, where they come from, and where they go. An example, Figure 1a illustrates how a typical entering freshman class moves through the various colleges at UNM.

The incoming first-time, full-time class shown in Figure 1a consisted of 2,909 students, 2,742 of whom were initially placed in University College, 28 who were initially placed in the College of Arts & Sciences, and 139 who were admitted into the School of Engineering's Pre-major program. By the end of the eleventh semester, 1,196 (41%) of the original cohort had stopped out, 1,117 (39%) had graduated, and 596 (20%) remained enrolled at UNM.

Figure 1b focuses on a particular sub-flow of students corresponding to those who graduated within four years (i.e., the students that reached node GRAD8 in the diagram). This sub-flow clearly demonstrates the path that most of these students followed involved spending their first four semesters in University College and that the vast majority of students who graduated in four years did so in the College of Arts & Sciences.

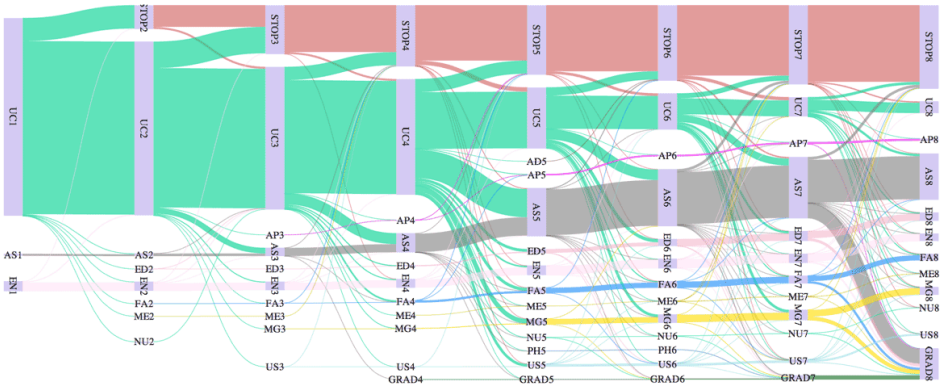


Figure 1a (full-size image)

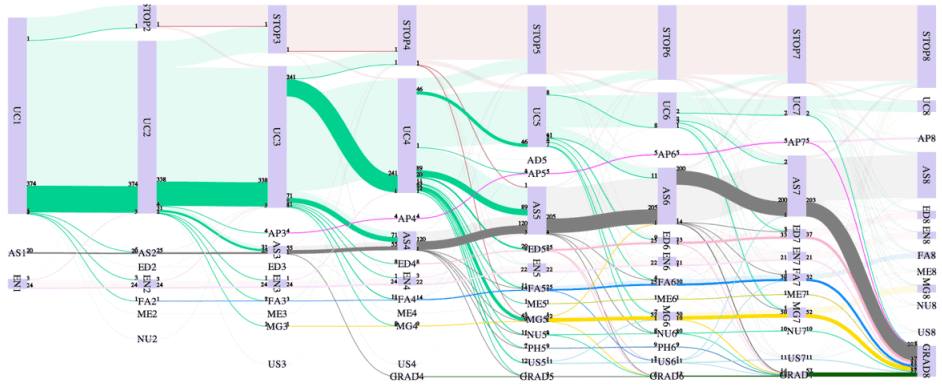


Figure 1b (full-size image)

Figure 1. *Sankey diagrams visualizing the flow of students from the 2007 first-time, full-time freshman cohort through the UNM system. UCx = University College in the x-th semester of enrollment, AP = School of Architecture & Planning, AS = College of Arts & Sciences, ED = College of Education, EN = School of Engineering, FA = College of Fine Arts, ME = Medical Education, MG = Anderson School of Management, NU = College of Nursing, STOP = student has stopped out, GRAD = student has graduated.*

Figure 1a: *The entire 2007 first-time, full-time freshman cohort.* ***Figure 1b:*** *The subset of students from the cohort that graduated by the eighth semester of attendance*

We have created similar Sankey diagrams that track student cohort flows through the degree programs offered within our colleges and according to various factors—such as ethnicity, gender, ACT/SAT score, and so on. These also revealed many structural features that have an impact on how students move through UNM. At an even finer grain, we were interested in studying the impediments associated with students moving through individual programs. This led to the creation of the curricular graphs described in the next section, along with the study of curricular efficiency.

Curricular Efficiency

From a qualitative point of view, it is generally understood that within a given institution, some curricula are more difficult to complete than others. It is also the case that the most difficult majors are often the same at different institutions. Yet, some schools are far more efficient than others at graduating students in these majors, even when accounting for differences in student preparation. Thus, we were interested in answering these questions: Can the intrinsic difficulty of a program be quantified, and, if so, can it be used to identify any inefficiencies that may exist in the curriculum itself? Following is an overview of our attempts to answer each of these questions in the affirmative.

The set of requirements associated with the curriculum in a particular degree program, along with the relationships between the individual requirements (e.g., course pre/co-requisites), can be represented as a directed acyclic graph. Figure 2 includes example graphs for electrical engineering programs at two different universities.

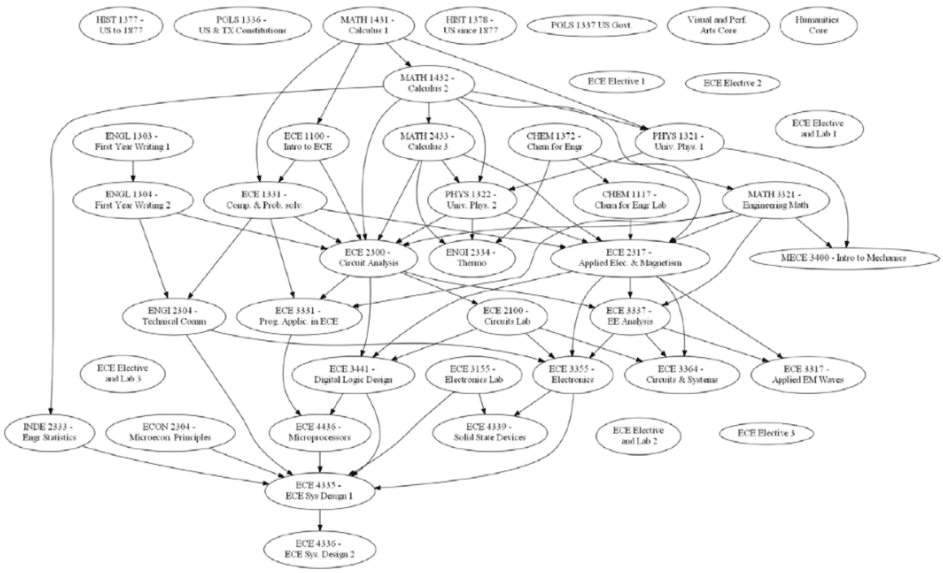


Figure 2a (full-size image)

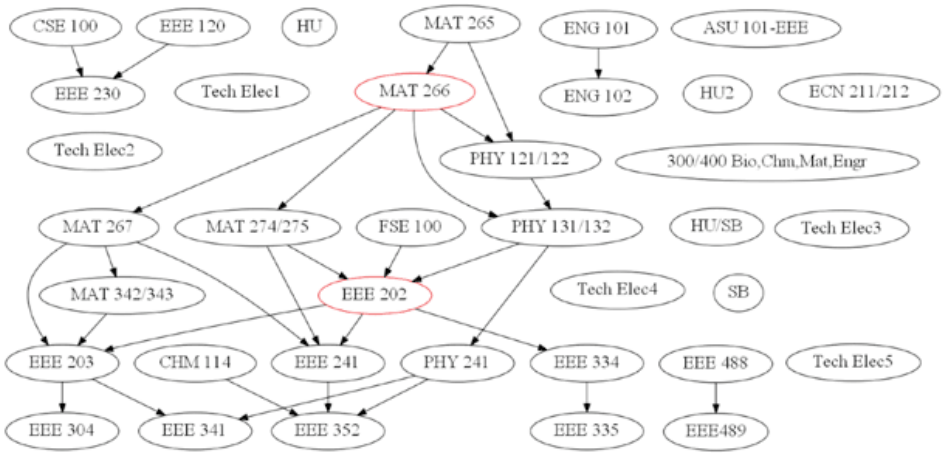


Figure 2b

Figure 2. *Electrical engineering curricula at two different four-year public institutions. The program shown in Figure b is more efficient than the one shown in Figure a.*

As the graphs show, even though these programs lead to the same degree, and are identically accredited, the degree requirements are vastly different. The curricular efficiency metrics we derived, described below, also show that the efficiency of the electrical engineering curricula in Figure 2b is much higher than that of Figure 2a. In other words, students enrolled in the former program will have fewer inherent difficulties completing degree requirements than those in the latter program. The actual graduation rates from these programs in fact validate this claim.

The curricular efficiency metric takes into account a number of factors. First, it accounts for the minimum total number of credit hours required to obtain the degree associated with a curriculum. This is a fairly obvious factor that intuitively should inversely correlate with curricular efficiency but perhaps positively correlate with program quality (up to a threshold). The number of hours in a curriculum has a significant impact on the number of hours a student must take per semester to graduate in four years, and this trickles down to the number of hours a student must spend per week on school-related activities. Next, the efficiency metric incorporates the number of courses that have high node degree in the curriculum graph—these correspond to bottlenecks in the curriculum graph, where failure to pass a bottleneck course can lead to the inability to progress in a timely manner. More specifically, courses with high in-degree are difficult to reach, as every requirement must be satisfied before enrolling in the course, and courses with high out-degree are critical in the sense that success in these courses opens up the possibility for students to enroll in many other required courses in the curriculum. Another factor is related to the number of long paths in the graph. Long paths represent chains of classes that must be taken in order. Failing a class that is part of a long chain often requires a student to take summer school to get back on track or he or she will fall behind by a semester or year, depending on the availability of the class. The logic is that the more long paths, the more likely a student is to get off-track, get frustrated, and drop out of a program. The final factor, referred to as curriculum rigidity, is related to the number of prerequisites in the graph. As the total number of prerequisites increases, a curriculum becomes more rigid in the sense that students have less flexibility in the order that courses must be taken, and any failure to pass a course or take it on time is more likely to lead to a delay in

graduation. Thus, a measure of the rigidity of a curriculum is given by the total number of edges in the curriculum graph, normalized by the total number of courses in the degree program.

Conclusions

Despite our improved understanding of student challenges and exponential increases in available data, complex personal challenges that integrate with more evident obstructions to persistence continue to cloud the student departure puzzle. Tinto emphasizes a focus on student persistence and not attrition, meaning there is more value in determining why students succeed than why they fail. The problem with this as a pure application is the shifting nature of psychosocial influences that can one moment enable a student to persist and, in another fleeting time frame, influence attrition. The common example would be immediate family support that motivates a student to pursue educational goals, yet inevitably may cause attrition sometime throughout a long and sometimes grueling four, five, six, or more years of higher education (Krumrei-Mancuso et al. 2012).

Considering the challenges of solving the complete puzzle, it is an efficient and useful investment for universities to continue to work on barriers to student persistence that are structural and independent of psychosocial aversions. In this case study, a deep investigation of student flow patterns combined with impactful graphical presentation highlighted a fundamental barrier of students progressing to degree-conferring colleges and led to a much more complex review of curriculum flow among programs. This in turn facilitated curriculum reform and the development of clear academic road maps available to students navigating their way through what is still a fog of requirements structured in an inefficient and sometimes inexplicable sequence. Ultimately, setting aside the discovery of confounding variables and visceral reactions that are contributing to persistence, attrition, or both has proven to be less critical than reexamining baseline student behavior. The result has yielded the implementation of technologically advanced tools to illuminate the student academic path, revision of curricular policy reducing and clarifying requirements, and a restructuring of the responsibility for student advising in schools and colleges.

REFERENCES

Berger, J. B., and S. Lyon. 2005. Past to present: A historical look at retention. In *College student retention: Formula for student success*, edited by A. Seidman, 1–30. Lanham, MD: ACE/Praeger.

Krumrei-Mancuso, E. J., F. B. Newton, E. Kim, and D. Wilcox. 2012. Psychosocial factors predicting first-year college student success. *Journal of College Student Development* 54 (3): 247–266.

Kuh, G. D., J. Kinzie, J. A. Buckley, B. K. Bridges, and J. C. Hayek. 2006. *What matters to student success: A review of the literature*. Commissioned report for the National Symposium on Postsecondary Student Success: Spearheading a dialog on student success. Washington, DC: National Postsecondary Education Cooperative.

Kuh, G. D., J. Kinzie, J. H. Schuh, and E. J. Whitt. 2010. *Student success in college: Creating conditions that matter*. San Francisco, CA: Jossey-Bass.

Moore, C., and N. Shulock. 2009. *Student progress toward degree completion: Lessons from the research literature*. Sacramento, CA: California State University, Institute for Higher Education Leadership & Policy.

Tinto, V. 1975. Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research* 45 (1): 89–125.

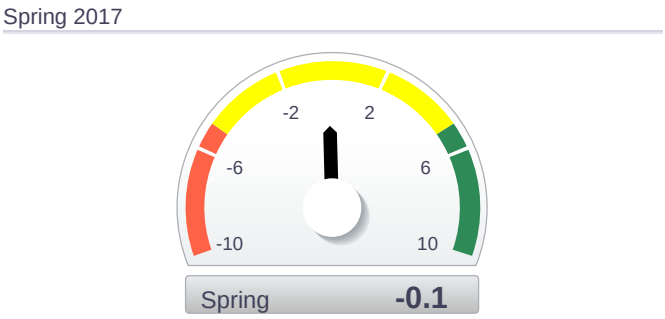
_____. 1987. Leaving college: Rethinking the causes and cures of student attrition. Chicago: University of Chicago Press.

Snapshot Enrollment Comparison Report

27 Days Till Start of Spring 2017

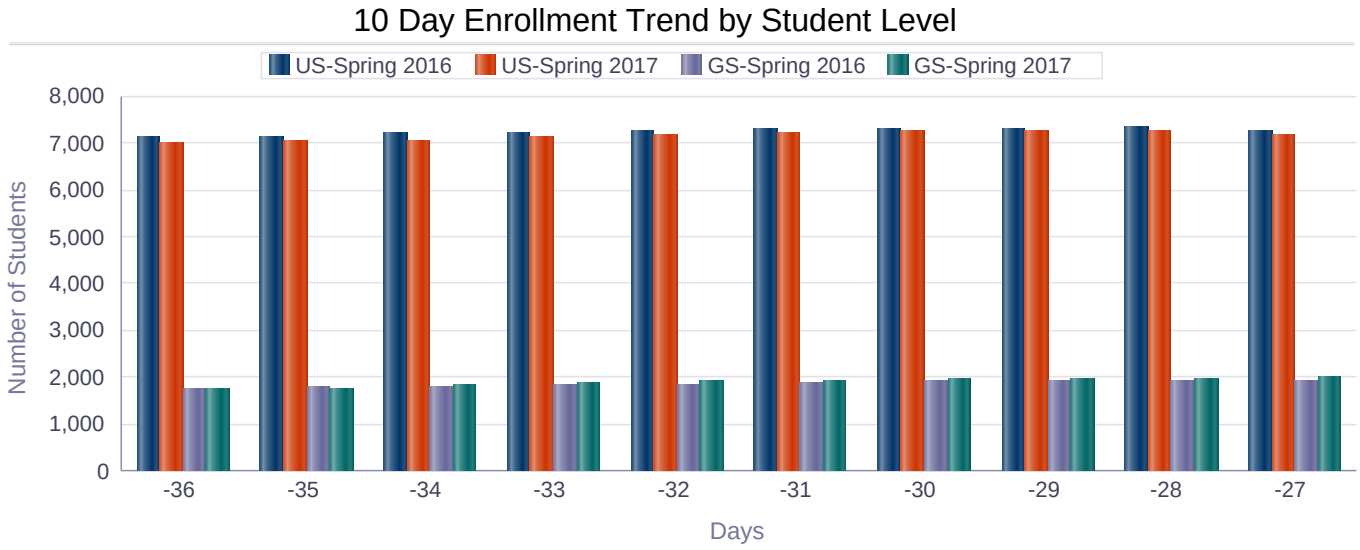
Current University Enrollment

Term	Last Year	Current Year	Number Difference	Percent Difference
Spring	9,173	9,160	-13	-0.1%



Current Enrollment by Student Level

Student Level	Last Year	Current Year	Number Difference	Percent Difference
Undergraduate	7,233	7,161	-72	-1.0%
Graduate	1,941	1,999	58	3.0%



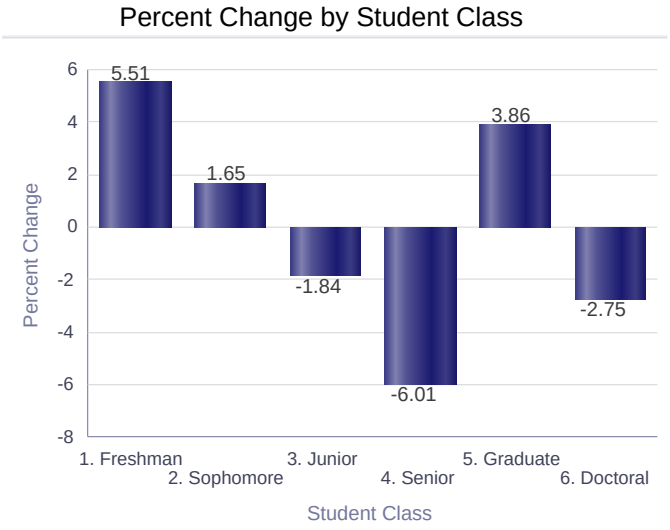
Note: Red cells indicate a percent change of less than -5.00%, yellow cells indicate percent change between -5.00% and 5.00%, green cells indicate percent change of greater than 5.00%, and medium grey indicate no percent change available.

Snapshot Enrollment Comparison Report

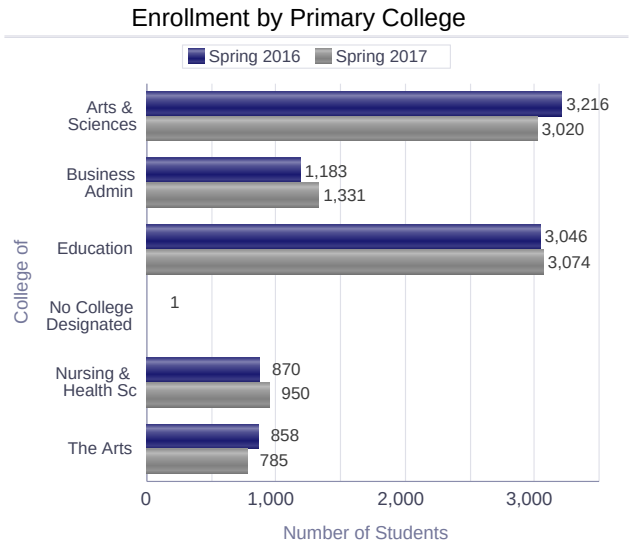
27 Days Till Start of Spring 2017

Current Enrollment by Student Class

Student Class	Last Year	Current Year	Number Difference	Percent Difference
1. Freshman	1,470	1,551	81	5.5%
2. Sophomore	1,574	1,600	26	1.7%
3. Junior	1,743	1,711	-32	-1.8%
4. Senior	2,446	2,299	-147	-6.0%
5. Graduate	1,686	1,751	65	3.9%
6. Doctoral	255	248	-7	-2.7%



Current Enrollment by Primary College



College of	Last Year	Current Year	Number Difference	Percent Difference
Arts & Sciences	3,216	3,020	-196	-6.1%
Business Admin	1,183	1,331	148	12.5%
Education	3,046	3,074	28	0.9%
Nursing & Health Sc	870	950	80	9.2%
The Arts	858	785	-73	-8.5%

Note: Red cells indicate a percent change of less than -5.00%, yellow cells indicate percent change between -5.00% and 5.00%, green cells indicate percent change of greater than 5.00%, and medium grey indicate no percent change available.

Snapshot Enrollment Comparison Report

27 Days Till Start of Spring 2017

Current Enrollment by College, Student Level, and Primary Major

College of	Level	Major Code	Major	Last Year	Current Year	Number Difference	Percent Difference
Arts & Sciences	US	MAA	Applied Mathematics	14	18	4	28.6%
Arts & Sciences	US	AAA	Associate of Arts	15	6	-9	-60.0%
Arts & Sciences	US	AST	Astronomy	17	15	-2	-11.8%
Arts & Sciences	US	BIO	Biology	546	524	-22	-4.0%
Arts & Sciences	GS	BIO	Biology	11	13	2	18.2%
Arts & Sciences	US	CHM	Chemistry	129	108	-21	-16.3%
Arts & Sciences	US	CIS	Computer Information Systems	87	97	10	11.5%
Arts & Sciences	US	CS	Computer Science	139	147	8	5.8%
Arts & Sciences	US	CRM	Criminal Justice	272	235	-37	-13.6%
Arts & Sciences	GS	CRM	Criminal Justice	11	8	-3	-27.3%
Arts & Sciences	US	CRMO	Criminal Justice - Online	79	77	-2	-2.5%
Arts & Sciences	US	EGS	Engineering Studies (2 yr)	167	145	-22	-13.2%
Arts & Sciences	US	ENG	English	113	103	-10	-8.8%
Arts & Sciences	GS	ENG	English	21	9	-12	-57.1%
Arts & Sciences	GS	ESLA	English Studies Lang Art Tchrs	6	11	5	83.3%
Arts & Sciences	US	EVS	Environmental Geosciences	39	43	4	10.3%
Arts & Sciences	US	FR	French	9	9	0	0.0%
Arts & Sciences	US	HIS	History	87	84	-3	-3.4%
Arts & Sciences	GS	HIS	History	4	1	-3	-75.0%
Arts & Sciences	US	INDS	Interdisciplinary Studies	109	96	-13	-11.9%
Arts & Sciences	US	SSS	Learning Support	45	29	-16	-35.6%
Arts & Sciences	US	LA	Legal Assistant Studies	26	19	-7	-26.9%
Arts & Sciences	US	LAO	Legal Assistant Studies-Online	1	5	4	400.0%
Arts & Sciences	US	MAT	Mathematics	43	46	3	7.0%
Arts & Sciences	US	MCO	Mathematics-Computr Sci Option	1	0	-1	-100.0%
Arts & Sciences	US	ORGL	Organizational Leadership	203	216	13	6.4%

Note: Red cells indicate a percent change of less than -5.00%, yellow cells indicate percent change between -5.00% and 5.00%, green cells indicate percent change of greater than 5.00%, and medium grey indicate no percent change available.

Snapshot Enrollment Comparison Report

27 Days Till Start of Spring 2017

College of	Level	Major Code	Major	Last Year	Current Year	Number Difference	Percent Difference
Arts & Sciences	US	PHRS	Philosophy & Religious Studies	21	14	-7	-33.3%
Arts & Sciences	US	PHY	Physics	15	13	-2	-13.3%
Arts & Sciences	US	POS	Political Science	118	109	-9	-7.6%
Arts & Sciences	US	EGR	Pre-Engineering	0	1	1	
Arts & Sciences	GS	PA	Public Administration	146	149	3	2.1%
Arts & Sciences	GS	SOCG	Sociology	10	9	-1	-10.0%
Arts & Sciences	US	SOC	Sociology & Anthropology	166	134	-32	-19.3%
Arts & Sciences	US	SPA	Spanish	41	33	-8	-19.5%
Arts & Sciences	US	CCT	Transient	11	28	17	154.5%
Arts & Sciences	US	LAS	Undecided	494	466	-28	-5.7%
Business Admin	US	ACC	Accounting	80	207	127	158.8%
Business Admin	GS	ACC	Accounting	27	22	-5	-18.5%
Business Admin	US	BAAC	BBA-Accounting	113	0	-113	-100.0%
Business Admin	US	BAEC	BBA-Economics	25	0	-25	-100.0%
Business Admin	US	BAFI	BBA-Finance	48	1	-47	-97.9%
Business Admin	US	BAHC	BBA-Healthcare Administration	81	0	-81	-100.0%
Business Admin	US	BAIB	BBA-International Business	54	0	-54	-100.0%
Business Admin	US	BAMG	BBA-Management	122	1	-121	-99.2%
Business Admin	US	BAMK	BBA-Marketing	132	1	-131	-99.2%
Business Admin	US	BA	Business Administration	221	174	-47	-21.3%
Business Admin	US	ECO	Economics	7	34	27	385.7%
Business Admin	US	FIN	Finance	33	95	62	187.9%
Business Admin	US	HCAD	Healthcare Administration	30	124	94	313.3%
Business Admin	US	IB	International Business	28	74	46	164.3%
Business Admin	US	MGT	Management	68	253	185	272.1%
Business Admin	US	MGTO	Management - Online	0	84	84	
Business Admin	US	MKT	Marketing	53	202	149	281.1%
Business Admin	GS	MBA	Master Business Administration	61	59	-2	-3.3%
Education	GS	ACE	Adult & Career Education	50	52	2	4.0%

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Snapshot Enrollment Comparison Report

27 Days Till Start of Spring 2017

College of	Level	Major Code	Major	Last Year	Current Year	Number Difference	Percent Difference
Education	GS	AC	Adult and Career Education	14	14	0	0.0%
Education	US	ASLX	Amer Sign Lang/Engl Interp-Coe	33	42	9	27.3%
Education	US	ASL	Amer Sign Lang/English Interp	42	46	4	9.5%
Education	GS	BE	Business Education-Grades 6-12	1	0	-1	-100.0%
Education	GS	SLPD	Clinical Doctorate in SLP	8	8	0	0.0%
Education	GS	COCP	Coaching Pedagogy in Phys Educ	10	14	4	40.0%
Education	GS	COMD	Communication Disorders	112	114	2	1.8%
Education	US	COMX	Communication Disorders	98	89	-9	-9.2%
Education	US	COMD	Communication Disorders	109	105	-4	-3.7%
Education	GS	CIAT	Curr&Inst Accomplished Teachin	119	126	7	5.9%
Education	GS	C&I	Curriculum and Instruction	52	59	7	13.5%
Education	US	ECEX	Early Childhd Educ-Coe	137	181	44	32.1%
Education	GS	ECE	Early Childhood Education	85	109	24	28.2%
Education	US	ECE	Early Childhood Education	77	84	7	9.1%
Education	GS	EL	Educational Leadership	1	1	0	0.0%
Education	GS	EDL	Educational Leadership	255	272	17	6.7%
Education	GS	ENG	English	2	0	-2	-100.0%
Education	GS	GIFT	Gifted Endorsement	1	4	3	300.0%
Education	GS	PE	Health/Physical Edu-Gr PreK-12	10	5	-5	-50.0%
Education	US	PE	Health/Physical Edu-Gr PreK-12	23	18	-5	-21.7%
Education	US	HCP	Human Capital Performance	7	4	-3	-42.9%
Education	US	HCPO	Human Capital Performnc-Online	17	17	0	0.0%
Education	GS	IT	Instructional Technology	116	122	6	5.2%
Education	GS	LDR	Leadership	103	95	-8	-7.8%
Education	GS	LIS	Library & Information Science	187	203	16	8.6%
Education	GS	MFT	Marriage/Family Therapy	59	65	6	10.2%
Education	GS	MGMS	Middle Grades Educ Math/Scienc	30	27	-3	-10.0%
Education	US	MGEX	Middle Grades Educ-Coe	105	96	-9	-8.6%
Education	US	MGE	Middle Grades Educ-Grades 4-8	70	50	-20	-28.6%

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Snapshot Enrollment Comparison Report

27 Days Till Start of Spring 2017

College of	Level	Major Code	Major	Last Year	Current Year	Number Difference	Percent Difference
Education	GS	MID	Middle Grades Education	6	2	-4	-66.7%
Education	US	OATO	Office Admin & Tech-online	12	12	0	0.0%
Education	US	OATX	Office Admin & Tech-online Coe	56	64	8	14.3%
Education	US	OAT	Office Adminstrtion & Technolo	64	45	-19	-29.7%
Education	GS	OLT	On-line Teaching Certificate	3	0	-3	-100.0%
Education	US	PEX	Physical Education-Coe	25	32	7	28.0%
Education	US	PSY	Psychology	278	257	-21	-7.6%
Education	GS	PSY	Psychology	48	43	-5	-10.4%
Education	US	PSYX	Psychology-Coe	176	178	2	1.1%
Education	GS	SCO	School Counseling	37	55	18	48.6%
Education	GS	SED	Secondary Education	4	4	0	0.0%
Education	GS	SCD	Secondary Education	22	18	-4	-18.2%
Education	GS	SWK	Social Work	103	104	1	1.0%
Education	US	SPD	Special Education	10	8	-2	-20.0%
Education	US	SPE	Special Education	48	53	5	10.4%
Education	GS	SPE	Special Education	43	51	8	18.6%
Education	GS	SPD	Special Education	9	14	5	55.6%
Education	US	SPDX	Special Education-Coe	11	7	-4	-36.4%
Education	US	SPEX	Special Education-Coe	38	9	-29	-76.3%
Education	GS	TL	Teacher Leadership	90	72	-18	-20.0%
Education	US	WED	Workforce Educ & Development	30	24	-6	-20.0%
No College Designated	GS	LIS	Library & Information Science	1	0	-1	-100.0%
Nursing & Health Sc	US	ANUR	Accel Pre-Nursing	0	30	30	
Nursing & Health Sc	US	AT	Athletic Training	30	17	-13	-43.3%
Nursing & Health Sc	US	EP	Exercise Physiology	64	58	-6	-9.4%
Nursing & Health Sc	US	NUR	Nursing	154	176	22	14.3%
Nursing & Health Sc	GS	MNUR	Nursing	38	38	0	0.0%
Nursing & Health Sc	US	PAT	Pre-Athletic Training	50	61	11	22.0%

Note: Red cells indicate a percent change of less than -5.00%, yellow cells indicate percent change between -5.00% and 5.00%, green cells indicate percent change of greater than 5.00%, and medium grey indicate no percent change available.

Snapshot Enrollment Comparison Report

27 Days Till Start of Spring 2017

College of	Level	Major Code	Major	Last Year	Current Year	Number Difference	Percent Difference
Nursing & Health Sc	US	PEP	Pre-Exercise Physiology	115	127	12	10.4%
Nursing & Health Sc	US	PNUR	Pre-Nursing	348	369	21	6.0%
Nursing & Health Sc	US	PNRN	Pre-RN-Nursing	0	4	4	
Nursing & Health Sc	US	NRN	RN-Nursing	1	0	-1	-100.0%
Nursing & Health Sc	US	DHG	WGTC-Dental Hygiene (AAS)	70	70	0	0.0%
The Arts	US	ART	Art	112	101	-11	-9.8%
The Arts	US	ARE	Art Education-Grades PreK-12	16	17	1	6.2%
The Arts	GS	COM	Communication	13	12	-1	-7.7%
The Arts	US	COMM	Communication	186	172	-14	-7.5%
The Arts	US	DANC	Dance	29	24	-5	-17.2%
The Arts	US	ID	Interior Design	43	53	10	23.3%
The Arts	US	MAS	Mass Media	268	237	-31	-11.6%
The Arts	US	MUS	Music	71	80	9	12.7%
The Arts	US	MUE	Music Education-Grades PreK-12	17	1	-16	-94.1%
The Arts	GS	MUE	Music Education-Grades PreK-12	4	3	-1	-25.0%
The Arts	US	MUP	Music Performance	23	12	-11	-47.8%
The Arts	GS	MUP	Music Performance	8	12	4	50.0%
The Arts	US	SPC	Speech Communication	0	2	2	
The Arts	US	THA	Theatre Arts	68	59	-9	-13.2%

Note: Red cells indicate a percent change of less than -5.00%, yellow cells indicate percent change between -5.00% and 5.00%, green cells indicate percent change of greater than 5.00%, and medium grey indicate no percent change available.

Advising Process and Survey Examples

University of North Georgia

The student self-assessment and advisor evaluation were developed as part of the redesign of the advising framework and to monitor performance as part of the SACSCOC Quality Enhancement Plan.

East Georgia State College

Included is a sample student self-assessment and analysis of the information collected from the survey.

University of Georgia

Included is a sample student self-assessment and advisor performance report based on the information collected from the survey.

Advisee Self-Assessment

Q1 This is a student self-assessment to provide feedback on the impact and quality of the UNG Quality Enhancement Plan (QEP) components and make improvements for the next year. This is only a measure of how well the program is working so please be very honest. Thank you for your feedback!

Q13 My home campus is:
- ❍ Cumming (1)
- ❍ Dahlonega (2)
- ❍ Gainesville (3)
- ❍ Oconee (4)

Q15 Please select in which of the following you are currently enrolled:
- ❍ Certificate program (1)
- ❍ Associate Degree Program (2)
- ❍ Bachelor's Degree Program (3)
- ❍ Other (4) _____

Q14 What is your major or area of study?
- ❍ Athletic Training Education (1)
- ❍ Biology (2)
- ❍ Chemistry (3)
- ❍ Communication (4)
- ❍ Computer Science (5)
- ❍ Criminal Justice (6)
- ❍ Dual Degree (7)
- ❍ Engineering (8)
- ❍ Film and Digital Media (9)
- ❍ General Studies (10)
- ❍ General Studies Health (11)
- ❍ History (12)
- ❍ International Affairs (13)
- ❍ Open Option (14)
- ❍ Physical Education (15)
- ❍ Physics (16)
- ❍ Political Science (17)
- ❍ Pre-nursing (to BSN) (18)
- ❍ Psychology (19)
- ❍ RETP (20)
- ❍ Other (21)

Q3 I am currently at the end of:

- ❍ My first semester at UNG (1)
- ❍ My second semester at UNG (2)
- ❍ My third semester at UNG (3)
- ❍ My junior year (4)
- ❍ My senior year (5)
- ❍ Other (6) _____

Q22 Do you intend to transfer to another institution before you finish 60 credit hours at UNG?

- ❍ Yes, I will transfer to another institution sometime before I finish 60 credit hours at UNG. (1)
- ❍ No, I do not intend to transfer before I finish 60 credit hours at UNG. (2)
- ❍ I'm not sure of my transfer intentions. (3)

Q4 How confident are you that you can:

	Not at all confident (1)	Somewhat confident (2)	Very confident (3)	Extremely confident (4)	Not applicable to me (5)
Relate your interests and abilities (strengths) to your chosen major (1)	❍	❍	❍	❍	❍
Relate your interests and abilities to possible educational/career options (2)	❍	❍	❍	❍	❍
Explain the core curriculum, program of study sheet, and degree map, including how they work together to create an educational plan (3)	❍	❍	❍	❍	❍
Identify campus resources to support your academic success (4)	❍	❍	❍	❍	❍
Explain the impact of multiple changes in your major to degree cost and time to completion (5)	❍	❍	❍	❍	❍
Explain the impact of not declaring a major by 30 attempted hours (6)	❍	❍	❍	❍	❍
Explain the registration policies/procedures including drop/add and withdrawal (7)	❍	❍	❍	❍	❍
Explain how to transition between degrees and	❍	❍	❍	❍	❍

campuses (8)					
Self-select courses for the following semester (9)	❍	❍	❍	❍	❍
Create an educational plan (potential course schedule) for the next two semesters based on the plan of study (10)	❍	❍	❍	❍	❍

Q5 Please share your level of success in attempting the following activities during the past semester:

	I attempted and was successful (1)	I attempted but was not successful (2)	I have not attempted (3)	Not applicable to me (4)
Speaking with a faculty or advisor regarding my interests and abilities with regard to my chosen major (1)	❍	❍	❍	❍
Speaking with a faculty in my major regarding my degree program, short-term/long-term goals, and/or career plans (2)	❍	❍	❍	❍
Completing a plan of study (3)	❍	❍	❍	❍
Utilizing campus resources to support academic success (tutorng, Supplemental Instruction, the Career Center, etc.) (4)	❍	❍	❍	❍
Acquiring information regarding drop/add, course withdrawal, and/or financial deadline dates and procedures either online or through an advisor/faculty (5)	❍	❍	❍	❍
Transitioning from an associate to baccalaureate degree or	❍	❍	❍	❍

between UNG campuses (6)				
Selecting courses for the following semester (7)	❍	❍	❍	❍
Creating an educational plan (potential course schedule) for the next two semesters based on the program plan of study for my major (8)	❍	❍	❍	❍

Q6 Please share whether you have used the following academic support services at least once in the past semester:

	Yes, I have used this service/program (1)	No, I have not used this service/program (2)
Career Services (1)	❍	❍
Center for Adult Learners and Military (2)	❍	❍
Center for Undergraduate Research and Creative Activities (3)	❍	❍
Disability Services (4)	❍	❍
Supplemental Instruction (SI) (5)	❍	❍
Writing Center (6)	❍	❍
Tutoring Services (7)	❍	❍
Labs (Math, Foreign Language, Science, Writing, etc.) (8)	❍	❍

Q9 I have attended at least one advising session with a faculty advisor this year:

❍ Yes (1)

❍ No (2)

Q10 If you attended at least one advising session with a faculty advisor this year, how useful was this advising session in helping you (leave blank if you did not attend):

	Not at all useful (1)	Somewhat useful (2)	Very useful (3)	Extemely useful (4)	Not applicable to me (5)
Understand academic major requirements (1)	❍	❍	❍	❍	❍
Understand the impact of time to graduation and cost that result from multiple major changes, changes to plan of study, and course withdrawal (2)	❍	❍	❍	❍	❍
Articulate how personal interests, strengths, and weaknesses relate to your major and career choice (3)	❍	❍	❍	❍	❍
Identify and use institutional, academic, and program resources to support/advance educational goals (ex. tutoring, Supplemental Instruction, etc.) (4)	❍	❍	❍	❍	❍
Identify career/educational opportunities related to major/pathway of interest (ex. internships, Study Abroad, etc.) (5)	❍	❍	❍	❍	❍

Q18 Please share any suggestions for improving your advising session:

Q7 I have attended at least one advising session with an academic advisor this semester:

- ❍ Yes (1)
- ❍ No (2)

Q8 If you attended at least one advising session with an academic advisor this semester, how useful was this semester's advising session(s) in helping you (leave blank if you did not attend):

	Not at all useful (1)	Somewhat useful (2)	Very useful (3)	Extremely useful (4)	Not applicable to me (5)
Understand the UNG core curriculum and major requirements (1)	❍	❍	❍	❍	❍
Understand the impact of time to graduation and cost that results from multiple major changes, changes to plan of study, and course withdrawal (2)	❍	❍	❍	❍	❍
Understand the advisor/advisee responsibilities (3)	❍	❍	❍	❍	❍
Articulate how personal interests, strengths, and weaknesses relate to your major and career choice (4)	❍	❍	❍	❍	❍
Identify institutional, academic, and program resources to support/advance educational goals (ex. tutoring, Supplemental Instruction, etc.) (5)	❍	❍	❍	❍	❍
Identify career/educational opportunities related to you major/pathway of interest (ex. internships, Study Abroad, etc.) (6)	❍	❍	❍	❍	❍

Q19 Please share any suggestions for improving your advising session:

Q11 I attended a New Student Orientation session this semester:

- ❍ Yes (1)
- ❍ No (2)

Q12 If you attended a New Student Orientation, how useful was it in helping you (leave blank if you did not attend):

	Not at all useful (1)	Somewhat useful (2)	Very useful (3)	Extremely useful (4)	Not applicable to me (5)
Understand UNG core curriculum and major requirements (1)	❍	❍	❍	❍	❍
Understand the impact of time to graduation and cost that result from multiple major changes, changes to plan of study, and course withdrawal (2)	❍	❍	❍	❍	❍
Understand the advisor/advisee responsibilities (3)	❍	❍	❍	❍	❍
Identify the campus, academic, and program resources to support/advance educational goals (ex. tutoring, Supplemental Instruction, etc.) (4)	❍	❍	❍	❍	❍
Identify career/educational opportunities related to major/pathway of interest (ex. internships, Study Abroad, etc.) (5)	❍	❍	❍	❍	❍

Q20 Please share any suggestions for improving the New Student Orientation:

Q16 Prior to attending UNG, new students were sent a link to mandatory Online Advising Modules. How thoroughly did you review these Online Advising Modules?

- ❍ I did not review them at all (1)
- ❍ I skimmed the material briefly (2)
- ❍ I reviewed most of the material (3)
- ❍ I reviewed the material thoroughly (4)
- ❍ I'm not sure (5)

Q17 How useful were the Online Advising Modules in helping you:

	Not at all useful (1)	Somewhat useful (2)	Very Useful (3)	Extremely useful (4)	I'm not sure (5)	Not applicable (6)
Understand UNG core curriculum (1)	❍	❍	❍	❍	❍	❍
Understand the advisor/advisee responsibilities (2)	❍	❍	❍	❍	❍	❍
Understand the advising tools available (Program study sheet, catalog, etc.) (3)	❍	❍	❍	❍	❍	❍
Understand the impact of time to graduation (15 to Finish) (4)	❍	❍	❍	❍	❍	❍
Identify institutional, academic, and program resources to support/advance educational goals (ex.tutoring, Supplemental Instruction, etc.). (5)	❍	❍	❍	❍	❍	❍
Identify career/educational opportunities related to major/pathway of interest (ex. internships, Study Abroad, etc.). (6)	❍	❍	❍	❍	❍	❍

Q21 Please share any suggestions for improving the mandatory Online Advising Modules:

University of North Georgia Advisor Evaluation

Please include the student's level of understanding at the beginning of the first and second semester sessions and at the end of the third semester session to measure progress over time.

No understanding: the student has no knowledge or concept of the topic

Minimal understanding: the student is aware of the topic but has a very limited understanding

Moderate understanding: the student is aware of the topic and articulates some of the details, issues, information

Substantial understanding: the student is aware of the topic and can articulate most or all of the details, issues, information

Did not observe: the advisee did not present evidence of the topic and no determination could be made by the advisor

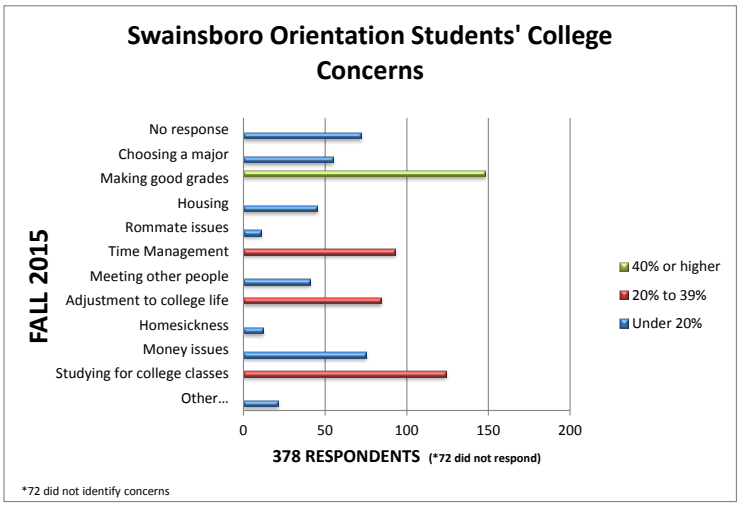
NA for this semester: the topic was not appropriate for the advisee this semester

Student demonstrates an understanding of:

	No understanding	Minimal understanding	Moderate understanding	Substantial understanding	Did not observe	NA for this semester
Interests and abilities with regard to chosen major	○	○	○	○	○	○
Core curriculum, program of study sheet, and degree map, including how they work together to create an educational plan	○	○	○	○	○	○
Resources for major exploration	○	○	○	○	○	○
Campus resources to support academic success	○	○	○	○	○	○
Impact of multiple major changes	○	○	○	○	○	○
Registration policies/procedures, including drop/add, withdrawal	○	○	○	○	○	○
Short and long-term goals, including major	○	○	○	○	○	○
Internal transfer process for change of degree level or change of home campus to or from DAH	○	○	○	○	○	○

Student demonstrates ability to:

	No ability	Minimal ability	Moderate ability	Substantial ability	Did not observe	NA for this semester
Select courses for the following semester {Student verbally or in writing identifies courses for the following semester}	○	○	○	○	○	○
Review academic progress {Student can identify academic progress made and next steps}	○	○	○	○	○	○
Reflect on appropriateness of academic path (if appropriate)	○	○	○	○	○	○
Access online advising tools and apply information {Student can access advising tools and use information presented}	○	○	○	○	○	○
Access Degree Works and discuss information/features {Student can access Degree Works and use information presented}	○	○	○	○	○	○
Create an educational plan for next two semesters based on the plan of study {Student brings written or verbal academic plan for the next two semesters or completes during advising session for first semester}	○	○	○	○	○	○



Swainsboro Orientation Attendee's Concerns Fall 2015		
Greatest Concerns	**Number of Responses**	**Percentage of Responses**
Choosing a major	55	14.6%
Making good grades	150	39.6%
Housing	45	11.9%
Roommate issues	11	2.9%
Time management	93	24.6%
Meeting other people	41	10.8%
Adjusting to college life	82	22.2%
Homesickness	11	3.2%
Money issues	75	19.8%
Studying for college classes	124	32.8%
Other	21	5.6%
No response	72	19.0%

Other (responses)….

- ✓ **"Transferring to Georgia Southern"**
- ✓ **"Availability of online classes"**
- ✓ **"Finding a job"**
- ✓ **"What is best route for getting into med school and to develop healthy and efficient study habits to get prepared for grad/med school"**
- ✓ **"Getting transportation to school"**
- ✓ **"Transfer credits and the amount of time it takes to get into nursing school."**

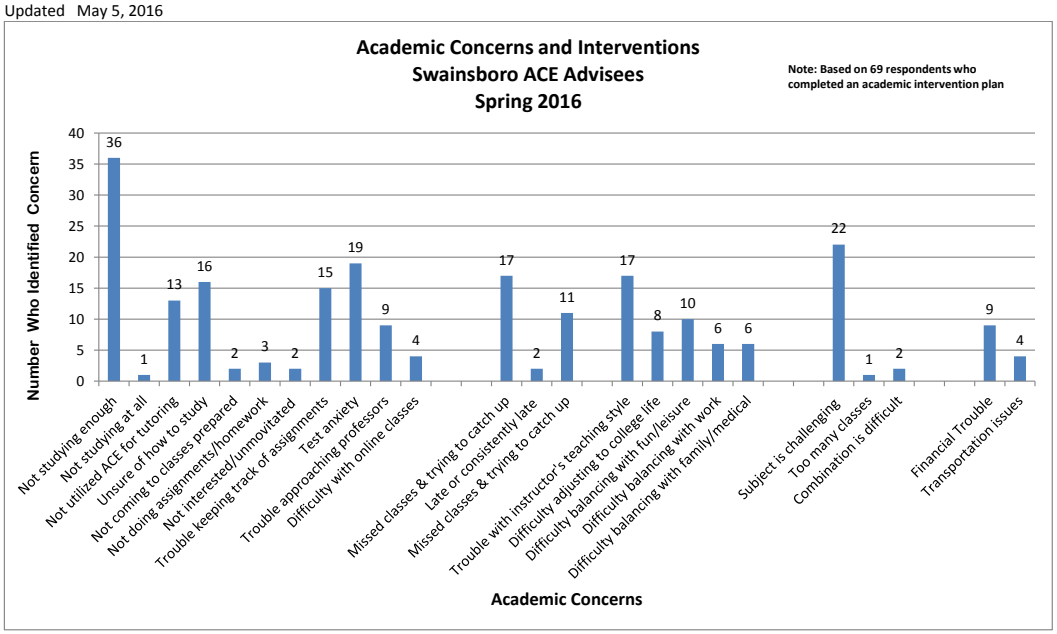
Other (responses)….

- ✓ **"What's the best way to earn a degree while raising a child?"**
- ✓ **"How will I know if I'm taking the right classes"?**
- ✓ **"Working while attending college."**
- ✓ **"Trying to make a class schedule that works around my softball schedule."**
- ✓ **"Joining an athletic team and classes (cheerleading and softball)"**
- ✓ **"Financial Aid and what do I have to pay back and I also have a loan"**
- ✓ **"Military life and school"**
- ✓ **What happens if student is denied housing?**
- ✓ **Culture**

Compiled information in reference to Advisement and Midterm Grades

For Swainsboro ACE Advisees in Spring 2016

Updated May 5, 2016



Compiled information in reference to Advisement and Midterm Grades

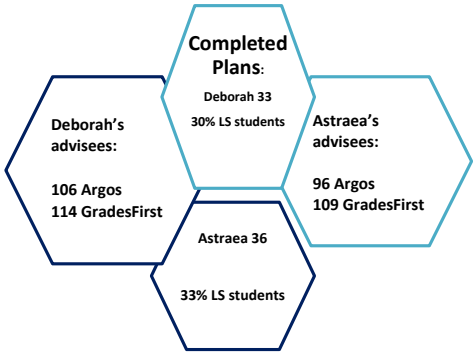
For Swainsboro ACE Advisees in Spring 2016

Updated May 5, 2016

Comments listed in other……..

…My teachers have not updated my grades.
…I understand it in class, but when it's time for testing; I blank out.
…Because I don't want an "F" to go on my transcript.
…I have a child on the way and have been going to the appointments.
….Did not have my Mathlab. Teacher is going to work with me.
…Just wasn't a good class for me.
…Medical issues/Death in the family
….The teacher is not teaching me well enough
…Bullied in the dorm

Completion of Academic Intervention Plans
Swainsboro ACE Advisees
Spring 2016



Advisement and Registration
Swainsboro ACE Advisees
Learning Support Classes
Spring 2016

CRN 20164 ENGL 0989 Advised & Registered **64%**
Enrollment totaled 14 students

Reasons LS students not registered for fall 2016

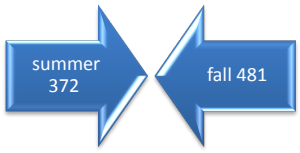
Registered for next term	9 students
Transferring/not returning	3 students
Athlete not registered	1 student
Student (MIA) not registered	1 student
	14 students

Compiled information in reference to Advisement and Midterm Grades

For Swainsboro ACE Advisees in Spring 2016

Updated May 5, 2016

EGSC Swainsboro current student
Summer & Fall 2016 Registration

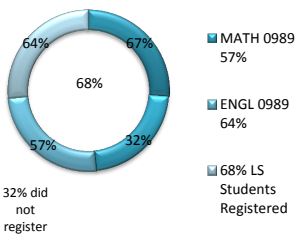


Advisement and Registration
Swainsboro ACE Advisees
Learning Support Classes
Spring 2016

CRN 20224 MATH 0989 Advised & Registered **57%**
Enrollment totaled 21 students
Reasons LS students not registered for fall 2016

Registered for next term	12 students
Administrative Holds (Parking Fine)	2 students
Transferring/not returning	4 students
Athlete not registered	1 student
Student (MIA) not registered	2 student
	21 students

Learning Support
Swainsboro Campus



Advisement and Registration
Swainsboro ACE Advisees
Learning Support Classes
Spring 2016

CRN 20225 MATH 0989 Advised & Registered **67%**
Enrollment totaled 28 students
Reasons LS students not registered for fall 2016

Registered for next term	19 students
Administrative Holds (Library Fine)	1 students
Transferring/not returning	4 students
Athlete not registered	3 student
Student (MIA) not registered	1 student
	28 students

*******3542BBA Intended Business[Terry] 0721 RMIN** | ***advised for BBA Intended Business* (20 April 2016)** | **_____ student initials**

Area I Foundation Courses

MATH 1113 (3)
Before you can apply to Terry College, MATH 1113 must be complete with a grade or exemption.

Additional Requirements

APPLICATION CHECKLIST TO TERRY COLLEGE

Your application deadline is September 1, 2016

STEP 1: Choose your majors!
--> First choice options: ACCT, ECON, FINA, MGMT, MIS, MARK, REAL, RMIN
--> Second choice options: ECON, MGMT, REAL, RMIN

STEP 2: Write your Statements of Purpose!
--> Write TWO statements of purpose: one for your first choice and one for your second choice.
--> Statements must be 300-400 words each.
--> In each, write about your interest in the major you are applying for, and about your future career goals with that degree. Edit them to perfection and save them to copy and paste into the online application.
-->NOTE: If you are applying to International Business, write about your interest in IB in the statement you write for your first choice major. Also address your level of knowledge in your foreign language.

STEP 3: Take the ETS Test!
--> Starting April 1, 2016, contact UGA Testing at (706)-542-3183 to set up an appointment to take the ETS.
--> This test is very similar to a short SAT: 36 multiple choice questions, 40 minutes timed.
--> For your first choice major you should shoot for a **470** score to be competitive (out of 500).
--> You can take it twice, if necessary. www.ets.org/proficiencyprofile/about

Once your essays are done, you can apply online starting July 1, 2016 at: http://www.terry.uga.edu/undergraduate

Terry will contact you after the Fall withdrawal deadline in Mid-October about your admittance status.
Review the attached sheet carefully and thoroughly before applying
Contact your advisor with any additional questions.

Other

Music Business

Contact Persons
David Barbe, Director
dbarbe@uga.edu

Tom Lewis, Associate Director
tomlewis@uga.edu

Ansley Stewart, Advisor and Office Manager
ansleys@uga.edu

David Lowery, Lecturer
dlowery@uga.edu

Terry College of Business
Music Business Program
201 Caldwell Hall
Office Telephone: 706–542–7668
Office Fax: 706–542–9292

College
Terry College of Business

An application within the Terry College of Business is required.

[Terry] General Electives

You need ONE more in this area.

List of upper level courses with few or no pre-requisites
http://tiny.cc/20rk7x

Upper level business courses open to Intended Business students are:
FINA 4050, ECON 4000, REAL 4000, ECON 4060 (ECON 2105 or 2106 is a pre-requisite)

[Terry] A&S Electives

You need ONE more course in this area.

Choose _ credits (1000 - 5000 level) from any of the following prefixes:

AFAM, AFST, AMHA, ANTH, ARAB, ARED, ARGD, ARHI, ARID, ARST, ARTI, ARTS, ASTR, BCMB, BENG, BINF, BIOL, CBIO, CHEM, CHNS, CLAS, CMLT, COMM, CSCI, DANC, DRAM, ECON, ECOL, EMUS, ENGL, ENTO, FANR, FCID, FILM, FREN, FRES, FYOS, GENE, GEOG, GEOL, GPST, GREK, GRMN, HEBR, HIST, HNDI, HONS, INDO, INTS, ISCI, ITAL, INTL, JPNS, KREN, LACS, LATN, LING, MAND, MARS, MATH, MIBO, MUSI, NAMS, PASH, PBIO, PERS, PHIL, PHYS, POLS, PORT, PSYC, PTSP, RELI, ROML, RUSS, SEMI, SCAN, SLAV, SOCI, SPAN, STAT, SWAH, THEA, TURK, URDU, VIET, WMST, YORB, ZULU

Suggested schedule for Summer:

MATH 1113 (3) - must take

Suggested Schedule for Fall:

ONE upper level elective (3)
ONE A & S elective (3)
Two other MINOR courses (if you decide on a Minor) 3+3

Important References

Financial Aid	**Admissions**	**Registrar**	**Student Affairs**	**Career Center**	**Academic Enhancement**	**University Testing Services**
220 Holmes-Hunter Building 706.542.6147	212 Terrell Hall 706.542.2112	105 Holmes-Hunter Building 706.542.4040	306 Memorial Hall 706.542.3564 askstudentaffairs@uga.edu	Clark Howell Hall 706.542.3375 Web: http://www.career.uga.edu/	222 Milledge Hall 706.542.5436	Clark Howell Hall 706.542.3183

UGA Bulletin online: http://bulletin.uga.edu

Schedule of Classes: http://www.reg.uga.edu/schedule-of-classes

SARA system: http://appoint.franklin.uga.edu

DegreeWorks: https://sis-degreeworks.uga.edu

Student Signature: _____ Advisor Signature: _____

I understand that the courses listed above are recommended for the academic term and major indicated. Any deviation from this recommended program of study may result in lack of progress toward the degree.

Date advised: 20 April 2016

Sara Student Advising & Registration Assistant

Calendar Stats

Select a date range to run stats on:

Start January 3 2016

End May 6 2016

Advisor [redacted]

Show All Stats

Description	Count	Time
Sick Leave	6	30 hours
Administrative Time	193	141 hours
No Show Walk In	8	10 hours
Holiday (Work Time)	1	6 hours
Out of Office (Non-Work Time)	7	3.5 hours
Orientation	12	9 hours
Drop/Add	10	34 hours
Other (Work Time)	2	2 hours
Walk In	55	75.25 hours
Student Appointment	237	161.75 hours
Staff Meeting	20	27 hours
TOTAL:	**551**	**499.5 hours**
TOTAL [minus Flex, Lunch and Out of Office (Non-Work Time)]:	**544**	**496 hours**

For the student meetings:

39 Unfilled Student Meetings at 114 Memorial Hall during that time period.

198 Filled Student Meetings at 114 Memorial Hall during that time period.

30 No-Shows during that time period: