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Information Management for UAlbany Honors College

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Information Management for UAlbany Honors College

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Abstract

Once you attract the best students to your campus, how do you keep them? University honors programs, a common means of attracting students in the competition for excellent students, have had difficulty retaining students in completing their honors education. Given the investment into honors students, strategies to improve outcomes would focus scholarship and teaching resources on some combination of students most likely to complete the program and assist those most likely to drop out. Additionally, by identifying predictors of retention and completion, the Honors College will be able to improve its admissions process to better select students most likely to complete the program.

Strategic decisions should rest upon accurate operational data. Due to the diverse campus units handling different datasets, limited staffing, and the accumulation of historical data, the Honors College has a slow and error-prone data management process, relying on manual transcription of data across isolated and distributed data sets. The goal of this project is to provide UAlbany's Honors College with the tools necessary to efficiently manage their student records and achieve higher retention rates by 1) identifying and improving data collection and curation processes for Honors College students, 2) developing and implementing a student information system (SIS), and 3) using regression analysis to identify predictors of honors program retention and completion for honors students.

When these tasks are completed, the University will be able to deploy its resources better, intervene earlier, and increase retention of its most promising student cohort. By reducing time spent managing student records with the SIS, the administration can dedicate more time engaging with students, potentially those at a higher risk of dropping out of the program. The results of the logistic regression analysis provide insight on this, identifying which pre-entry and post-entry variables are significant predictors of retention and completion. HSGPA is the most significant pre-entry predictor for 1-Year Retention and 4-Year Completion, and Term 1 GPA is the most significant post-entry predictor of 1-Year Retention, 1-Year to 2-Year Retention, and 4-Year Completion.

Keywords: *Student information system, Honors program retention rate, Honors program completion rate*

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I. Introduction

Admittance to an honors college can be the deciding factor for top students to enroll in a public university over a private college. Surveys have indicated that about half of honors freshmen would have enrolled elsewhere if not offered a spot in their chosen college's honors program (as cited in Goodstein & Szarek, 2013). Honors programs can provide a myriad of benefits and privileges to students, including honors courses with exceptional faculty, undergraduate research opportunities, honors academic advising, and honors housing (National Collegiate Honors Council, 2017). When admitted to the Honors College at University at Albany (thereafter "UAlbany Honors College"), students are invited to join a "community of developing scholars," comprised of the top 5-9% of students in each entering class. In addition to the benefits previously mentioned, UAlbany honors students receive priority class registration, access to honors peer mentors, and can attend exclusive weekly social and academic events hosted by the Honors College (University at Albany, SUNY, n.d.b).

Although such benefits are successful in recruiting students to enroll in an honors program, they are typically not enough to retain most students through graduation. Long-term retention is a challenge faced by most honors programs in the United States, where the average honors program completion rate is about 30% (Goodstein & Szarek, 2013). UAlbany's Honors College is, unfortunately, no exception; out of the students admitted to the University between Fall 2013 – Fall 2016 who were admitted to the Honors College directly or after their first semester, only 25% graduated from the Honors College within four years of their admittance. Although such a low completion rate is common, it is in a program's best interest to admit students most likely to complete the program and assist those most likely to drop out, given the scholarship and teaching resources invested into honors students. As Goodstein and Szarek

(2013) note, “an opportunity cost occurs when other honors-eligible students who would have been fully participating members were not admitted to the program due to a lack of space.” Given UAlbany Honors College’s rapid growth during the 2020-2021 academic year, having increased honors freshman admittance by approximately 106% this past fall from the usual 125 direct admits, it is more crucial now than ever to develop strategies to improve retention and completion rates.

In addition to retaining students, the UAlbany Honors College administration is responsible for managing honors student records. Given the College’s lack of an internal information system coupled with their dependency on multiple departments within the University for data about its students, maintaining and reviewing student records is a relatively time-consuming task. Furthermore, it is difficult to get a holistic view of an individual student’s profile and academic progress. Information about student demographics, student housing, GPA and credits earned, and completed honors theses come from different campus units, including Undergraduate Admissions, Student Support Services, ResLife, Institutional Research, Undergraduate Education. This results in multiple workbooks that remain to be more effectively integrated. Although the Honors College has been able to maintain its non-integrated student records for the past 15 years, the rapidly growing honors student body will strain this process. More time and resources will need to be invested into maintaining these records, time which could be more valuably spent engaging directly with the student body.

The goal of this project is to provide the UAlbany Honors College with the tools necessary to efficiently manage their student records and to achieve higher retention rates by 1) identifying and improving data collection and curation processes for Honors College students, 2) developing and implementing a student information system (SIS) and 3) using regression

analysis to identify predictors of honors program retention and completion for honors students. The data referred to in this project is only the data previously stored in Excel spreadsheets and does not include other file types, including Word documents, PDFs, and images. The three tasks combine to create a rich platform for understanding the characteristics of the University's honors student pool and apply that information to the current and future pools of Honors College students. Through these tools, the University will be able to deploy its resources better, intervene earlier, and increase retention of its most promising student cohort.

II. Student Information System Design and Implementation

2.1 Literature Review

Efficient data management plays a crucial role in an organization's ability to operate. An organization's demand for an administrative information system increases as the number of processes performed grows; this allows for secure data management in daily operations and consistency in long-term planning (Gorr & Hossler, 2006). Given that colleges have been shifting to a business-like model to manage their resources, management tools have been more frequently sought out to achieve an organization's goals (Gorr & Hossler, 2006).

One of the initial decisions to make when implementing an information system is whether it will be custom built or use vendor software. Both options have their own strengths and weakness in terms of customization, implementation cost, and level of IT expertise needed in the staff, as identified by Gorr and Hossler (2006). First, homegrown systems allow for direct control over system design and significant customization, which is especially beneficial for organizations with unique functionality requirements. Additionally, having the flexibility to develop the specific desired functionalities is more cost-efficient than paying for a vendor solution with some unused functionalities. However, there is a trade-off that comes with the customization freedom of a build-your-own system – the lack of a third-party IT support team that shares the responsibility of implementing the system. Lastly, vendors often have better documentation and reduce the need for the organization's staff to have a technical skillset. Therefore, if an organization decides to build their own information system, it is crucial for there to be sufficient documentation and user training to ensure the system's long-term success.

After deciding which software type to use, the techniques and methodologies established in information systems best practices should be utilized during the design and implementation

processes. According to Sullivan and Porter (2006), some of the top key factors in implementation success include utilizing a proven implementation methodology, effectively communicating with the customer organization, and carefully managing expectations for the project's scope. Satzinger, Jackson, and Burd (2016) provide a detailed design and implementation methodology, using the system development life cycle as a framework to identify all activities involved in researching, building, deploying, and maintaining an information system. System analysis activities include information gathering, identifying user stories and use cases, determining system functionalities (FURPS), use case modeling, and domain modeling; system design activities include creating user interfaces and designing the database (Satzinger et al., 2016). In terms of communication, Satzinger et al. (2016) emphasize the value of an agile approach over a predictive approach to minimize risk and increase flexibility in a project's development. By routinely communicating with the system users and demoing the system's developmental progress, business analysts can better ensure their system is meeting the end user's needs and make necessary changes before the final product is implemented. Lastly, to manage a project's scope, it is best to rank the requested system functionalities from high to low priority based on their importance, risk, complexity, and size (Satzinger et al., 2016). This system development model recommended by Satzinger et al. is followed in the structure of this document and has been used to design and implement the SIS for UAlbany's Honors College.

2.2 Positioning

2.2.1 Problem Statement

After increasing the number of admitted honors freshmen by 106% for the 2020-2021 academic year and a continued lack of data integration, the Honors College is at risk of investing

too much time in manually updating and reviewing student records. An important responsibility of the Honors College administration is to ensure their students' success by tracking their progression towards the completion of the honors graduation requirements. Without integrated data, it can take the Dean an extended time to manually review student records at the end of each semester. Although time-consuming, this task is essential to maximizing the potential of the Honors College, as those who are not meeting the requirements are put on probation or dismissed. Student review allows the administration to identify students who need more support, as well as to redirect resources to support all students and programming.

The requirements to graduate from UAlbany's Honors College are as follows (University at Albany, SUNY, n.d.b):

1. Incoming freshmen (direct admits) must earn 18 honors credits; first-year admitted students must earn 12 honors credits. Honors credits are earned by taking courses offered by departments that have been approved as honors-level by the Honors College.
2. Incoming freshmen must earn at least a 3.25 GPA their first semester and at least a 3.30 overall GPA for their first year. First-year admits must earn at least a 3.5 GPA spring semester. All students must earn at least a 3.50 GPA each subsequent semester after their first year, regardless of their admission time.
3. Students must complete an honors thesis or creative project.
4. Students must complete any additional requirements for their major's departmental honors program if one exists.

Additionally, to qualify for honors housing, students must meet the following requirement:

1. Attend 7+ honors events each semester (this specific number is subject to change).

Given the changing GPA requirements as one progresses through the program and the dichotomy between incoming honors freshmen and those admitted after their first or second semester, tracking students' academic progression is a rather complicated task. Additionally, given that students' honors academic requirements junior and senior year are determined by each individual departmental honors program rather than the Honors College, it is difficult to track students' progress beyond the completion of the 12/18 honors credits. Rather than wait until the end of senior year to see whether students will submit their thesis, it may be helpful to routinely receive departmental program enrollment from each director to verify whether juniors and seniors are meeting this requirement to graduate. For students without a departmental honors program, they could be required to submit a report to the Honors College regarding the project they are working on and who their faculty advisor is.

Another challenge for the Honors College administration is its reliance on multiple other departments within the University for information about its students. The Admissions Office and Residential Life annually provide the Honors College with information about the incoming class of honors freshmen, including demographic information, academic information, and housing placements. Additionally, the Dean extracts information from UAlbany's Integrated Administrative System (IAS) and consults with honors advisors, concerning honors students' academic performance at the end of each semester. In addition to these external data sources, the Honors College maintains its own internal records, such as attendance at honors events, honors thesis information, and honors courses offered each semester. A timeline of the Honors College's major business cycles is outlined in Table 1.

Table 1. Honors College Business Cycles

Business Process	**Timeframe**
Receive admissions decision information	Summer
Receive housing placements	Summer
Update student majors	Beginning of semester
Inform honors directors of students in their department	Beginning of semester
Honors course scheduling	Semester-long
Collect theses and future plans	Semester-long
Record event attendance	Semester-long
Send ResLife list of honors housing qualifiers	Mid-semester **spring only*
Submit a list of honors graduates to the Registrar	End of semester
Update student GPAs and credits	Over break (winter/summer)
Review and admit current UAlbany applicants	Over break (winter/summer)
Send honors course offerings to Registrar	Over break (winter/summer)
Review students' academic performance	Ongoing

Currently, the Honors College relies heavily on numerous files to track these different pieces of information – student enrollment, housing placements, GPA and honors credits, honors event attendance, and thesis completion. Since these data sets are isolated in their respective Excel spreadsheets, it is impossible for the Dean to query the data quickly to get useful information on the entire student body or examine an individual student's overall progress. For example, if the Dean wanted to view a senior's thesis information and semester GPAs earned, then this would require looking up the student in two separate data sets. As the Honors College continues to grow, it will become increasingly time-consuming for the Dean to maintain and review student records. Therefore, it is crucial to improve the Honors College's data management system to ensure accuracy and reduce the time spent on data entry to allow the administration to invest their time into more valuable tasks.

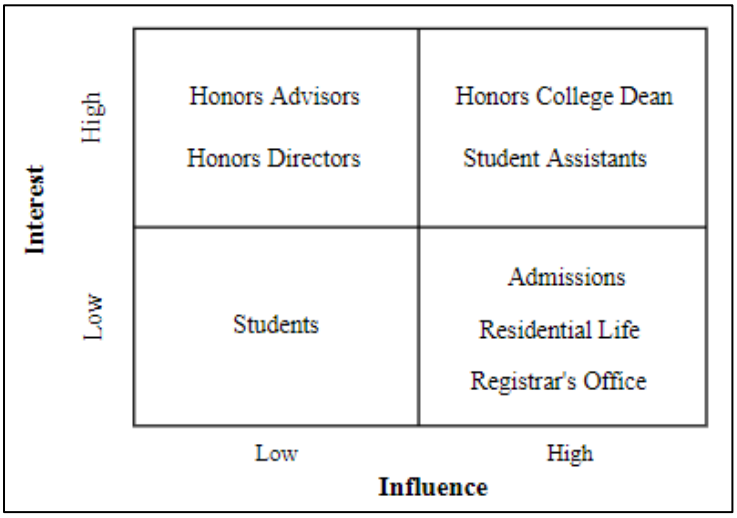
2.2.2 Product Position Statement

After the recent influx of honors students, UAlbany's Honors College needs a more efficient and reliable data management process to maintain and review their student records. Microsoft Access is an ideal software to use to build the student information system, as the system can be custom-built at a low cost to the University. Given the uniqueness of each honors program's goals and features, UAlbany's Honors College would benefit from a custom-designed system rather than use a vendor software solution. Developing the system with UAlbany's Honors College as the only intended user will allow for specific needs to be met, such as creating academic performance review queries that filter the data based on the various academic requirements outlined in Section 2.2.1. Additionally, housing the Honors College's information system on Microsoft Access will enable the University to better utilize their subscription to Microsoft Office. Although there will be no additional costs to buy new software, the University will need to anticipate small post-implementation costs, such as training the administration to use the system.

2.3. Stakeholder and User Descriptions

The Honors College student information system will have several key stakeholders and users. Both groups have an interest and/or influence over the system, but users are the only parties that will interact directly with the system once implemented. The stakeholders of the Honors College SIS include the honors advisors, departmental honors program directors, Registrar's Office, Admissions Office, Residential Life, and honors students. The current users include the Dean of the Honors College and his/her student assistants. Identifying the relative interest and influence in the system provides a lens by which the systems functions deliver the most effect.

Figure 1. Interest/Influence Matrix



2.3.1 Stakeholders

There are currently two honors advisors who work with honors students to ensure they are on track to meet all of their honors academic requirements. Incoming honors freshmen initially have their designated honors advisor and gain a second departmental advisor once they declare a major. Since the honors advisors are housed in the Academic Support Center and are not directly supervised by the Honors College, it is challenging for Honors College's student records to match the honors advisors' records. Maintaining identical enrollment records has proven to be difficult, especially when students withdraw from the program and given the variability in whether the student notifies their advisor, the Dean, or both. Since the Honors College Administration currently stores each academic class of student records in separate Excel workbooks, it is difficult to compare the Honors College's records to the advisors', as it is not possible to query a list of active students across all classes. These workbooks are not used by the advisors, as they maintain their own records in an EAB system. Additionally, the reasons why students leave the Honors College are not well documented. Reasons are currently detailed in a "Notes" column in the Excel sheets, rather than selected from a dropdown list that could then be

filtered or queried. Due to these inconsistencies, the honors advisors have a high interest in the system, as a better alignment of student records across departments would be beneficial to ensure the advisors are only engaging with active honors students.

Similar to the honors advisors, the departmental honors program directors have a higher interest in the system than influence. Each semester, the directors receive a list via email of honors students majoring in their field. The directors can then use this list to recruit new students and strengthen their pipeline of future students. However, the current challenge is to ensure directors are receiving an accurate list of students in their major. Given the frequency of major changes among freshmen and sophomores, the students' major field should be updated at the beginning of each semester. Currently, this is a time-consuming, error-prone task that requires extracting student majors from IAS, manually decoding each student's degree plan, and then going row-by-row in the Excel sheet to identify students who have changed their major. If honors directors are given incomplete and/or incorrect student lists, then some students may miss important information about their departmental program as well as the opportunity to connect with their program director.

In contrast to the advisors and directors, the Admissions Office, Residential Life, and Registrar's Office have a low interest in the system and a great influence over some components of its design. First, the system needs to be compatible with the data Admissions and Residential Life send to the Honors College. This will require the fields in certain tables to match the fields in the data extracts these departments send, so the data can be seamlessly imported into the database. Additionally, the Dean routinely sends the Registrar's Office a list of graduating seniors at the end of each semester. The system can help support this process by verifying that the seniors have met all graduation requirements.

Lastly, the honors students have both low interest and influence over the system. Although the students will ultimately benefit from the system's implementation and are the subject of many data points within the system, they have no direct interaction with it. The only time the students indirectly interact with the system is when they submit their theses and future plans surveys. Therefore, compared to the other stakeholders, they have relatively low interest and influence.

Table 2. Stakeholder Summary

Name	Description	Responsibilities
Honors Advisors	Work closely with honors students to ensure they complete all the requirements to graduate from the Honors College (University at Albany, SUNY, n.d.b)	Need to ensure their student enrollment records match the Honors College's records
Departmental Honors Program Directors	Supervise honors students' development in their chosen disciplines and offer support as they write their senior theses (University at Albany, SUNY, n.d.b)	Need an accurate list of potential future students to proactively engage with; provide the Honors College with program enrollment
Admissions Office	Help make Honors College admissions decisions for incoming freshmen	Annually provide data on incoming honors freshmen
Residential Life	Determine housing placements for honors students	Annually provide a list of incoming honors freshmen's housing placements
Registrar's Office	Schedules course offerings, maintains student academic records, and approves graduation requests	Schedules honors courses and verifies that students have met all requirements to graduate from the Honors College
Honors Students	Must meet certain academic requirements to remain an active member of and graduate from the Honors College	Will benefit from increased efficiency and accuracy within the Honors College administration

2.3.2 Users

The Honors College Dean and Student Assistants have a high interest in and influence over the student information system, as they will utilize the database daily to complete various administrative tasks. The Dean has a myriad of responsibilities regarding student records, with

one of the most important being reviewing student records each semester to identify those who are not on track to meet the Honors College graduation requirements. Additionally, the Dean collects information from each Honors College graduate regarding their thesis and future plans. The Dean or his/her assistants then upload all the student theses to Scholars Archive, a university-wide repository where students' and professors' research is publicly available. Lastly, the Dean is responsible for creating the schedule of honors courses that will be offered each semester. Each of these tasks either requires or generates data, which is primarily stored in individual Excel spreadsheets.

The Honors College Student Assistants aid the Dean in his/her responsibilities, except for reviewing student records due to privacy reasons. The Dean delegates other responsibilities to the assistants as deemed necessary.

Table 3. User Summary

Name	Description	Responsibilities	Represented by
Honors College Dean	Primary user of the system	• Maintain list of active honors students • Review students' academic performance each semester • Track honors event attendance • Upload theses to Scholars Archive • Create a schedule of honors course offerings each semester	Dean Hui-Ching Chang
Honors College Student Assistants	Secondary users of the system	• Delegated administrative tasks as deemed appropriate by the Dean	Dean Hui-Ching Chang

2.3.3 User Environment

The Honors College data is currently managed by the Dean and her 1-3 student assistants. The administration primarily utilizes Excel and OneDrive to record and organize their information, respectively. Each semester, new spreadsheets are made to track honors courses offered, honors events planned, and honors event attendance. Annually, spreadsheets are

received containing student enrollment information and housing placements. Student enrollment and academic information are stored in Excel sheets by academic class, which are manually updated each semester with GPAs, honors credits earned, and major changes based on data extracts from IAS. As the number of honors students continues to grow, these tasks have become increasingly time-consuming for the Dean.

Over time, the Honors College has accumulated many spreadsheets, requiring extensive file organization in OneDrive. By implementing an Access database system, data can be imported into tables within the database and significantly reduce the number of Excel files stored on OneDrive. The system will need to be compatible with the data extracts received from the Admissions Office, Residential Life, and IAS so the data can be seamlessly imported into Access via linked Excel sheets.

2.3.4 Key Stakeholder and User Needs

Key stakeholder and user needs determine the scope of the project and are ranked by their assessed priority of high, medium, or low. Priority rankings are based on the need's importance to the user and the complexity of implementing the proposed solution. Table 4 includes a list of needs, their priority, and proposed solutions.

Table 4. Summary of Key Stakeholder and User Needs

Need	Priority	Concerns	Current Solution	Proposed Solutions
Ability to query across class years of student data	High	Cannot get a single list of all active students or view all students by major	Student records are stored in separate Excel workbooks by academic class year	Consolidate student records so they can be queried
Gain better insight on student academic progress and which honors requirements have been met/not met	High	Reviewing student records at the end of each semester is becoming increasingly time-consuming for the Dean	Dean manually updates an Excel sheet each semester with students' GPAs and credits earned	Create queries to filter student records to those who are not meeting different requirements
Integrate data received from Admissions, Residential Life, and	High	All student data should be integrated to get a holistic view of	Each academic year, multiple spreadsheets are made to track all	Store all related student data in a single place, using a student's

IAS with internal Honors College records		students when necessary	these different pieces of information	UAlbany ID to link related records
Establish a uniform way to track when and why students leave the Honors College	Medium	This is valuable information that could be used to analyze retention rates	Reasons for departure are listed in a "Notes" section	Distinguish students as either "Active," "Withdrew," "Transferred," "Dismissed," or "Graduated" and record which semester they left
Track student enrollment in departmental honors programs	Medium	Students who are not fulfilling this requirement are unlikely to graduate from the Honors College	This information is currently not collected. It is uncertain how many seniors will complete their thesis until the deadline to turn it in	Ask honors departmental directors for program enrollment and then record this data
Ability to query across historical honors course offerings	Medium	It would be useful to have different course views to assist with course planning	Courses information for each semester is stored in separate Excel sheets	Consolidate honors course records to support views by semester, department, professor, and gen ed requirement fulfillment
Ability to query across student theses and future plans	Low	It would be useful to view theses by department and graduates by those attending grad school or working full time to better utilize the alumni network	Each graduating class's thesis information and future plans are stored in individual spreadsheets	Consolidate thesis and future plan information so it can be queried
Establish a historical record of honors event attendance	Low	Determining who qualifies for honors housing is time-consuming when attendance records for each semester are stored in separate worksheets	Each semester has its own attendance spreadsheet	Consolidate attendance records so they can be queried

2.3.5 Alternatives and Competition

While it has been recommended that the Honors College design a custom student information system, there are two alternatives that were taken into consideration. The first option was to continue using the current data management methods, which involves storing data in multiple isolated Excel sheets and manually entering and updating records. One benefit of this option is that no internal change would occur. The administration would not need to be trained

on how to properly utilize new software and could continue confidently using their Excel sheets. However, it is worth the short-term investment of training the administration to use a new information system to reap the long-term benefits of efficiency and accuracy.

The second option was to use a vendor software solution, which is pre-designed software that can be implemented within an organization. Some examples of student information system software include Destiny One, STARS, and Workday Student. Proponents of off-the-shelf solutions argue that there is better user documentation, technological support, and accessibility to routine software updates (Gorr & Hossler, 2006). For example, it is much easier to troubleshoot an issue when there is a designated IT person from the software company on call. However, such benefits come at a price, and the Honors College does not have the funding to implement customized vendor software. Instead, designing a fully customized SIS using Access is a cheaper solution that can still ensure the Honors College's specific user needs are met.

2.4 Product Perspective and Dependencies

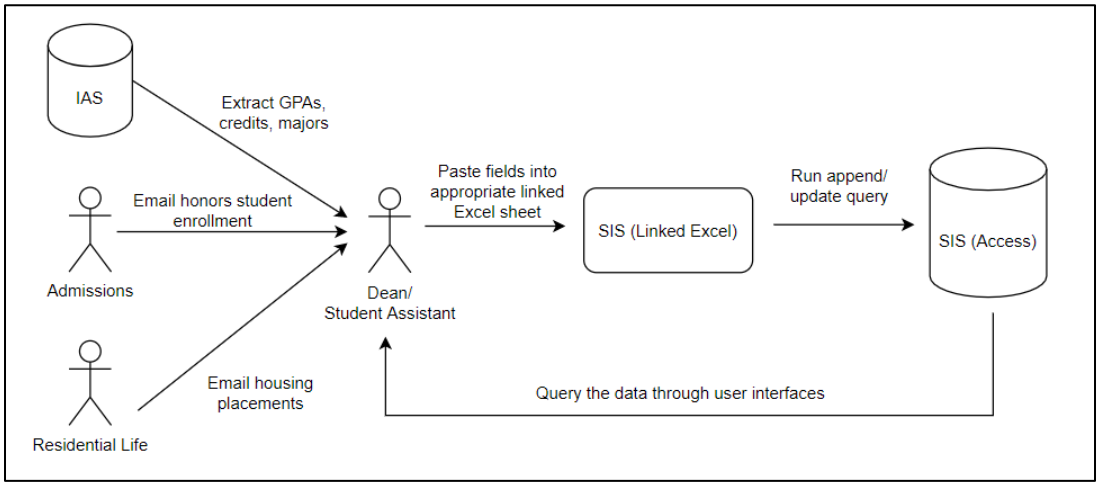
The student information system will be partially reliant on several other systems, integrating the Honors College's own internal records with those received from other departments and extracted from IAS. This project assumes that the departments providing the data will not change and the University will use IAS as its student information platform for the foreseeable future. Since the University will always need to track student enrollment, housing, GPAs, and credits earned, these data sets should always be available, but the source of them could change. If such changes occur, then the Dean will need to coordinate with these new departments to ensure they can send the necessary data extracts.

Currently, the Honors College receives student enrollment data from Admissions and housing placements from Residential Life each summer via email. These data sets will be copied

and pasted into an Excel sheet linked to the Access database, allowing the user to import the data through the linked tables and append the records to the main tables in the database. Since the fields in each extract could vary over time, the Honors College Administration will need to be observant of any changes and ensure the correct data is copied from the extracts into the linked Excel workbook. Each linked table in the database has a corresponding sheet in the linked Excel workbook to be used for the data imports.

Additionally, the Dean will be routinely querying student GPAs, honors credits, and majors from IAS. This data will be imported into the database with the linked Excel sheets as well. Since the standard queries available in IAS should change over time, the Dean may need to consult ITS for assistance in the future so she can continue extracting the data she needs.

Figure 2. System Dependencies



2.5 User Stories & Acceptance Criteria

Based on the author's experience working as an Honors College Student Assistant and an interview with the Honors College Dean, five user stories have been identified and the acceptance criteria for each listed. User stories help highlight a task the user needs to complete and what the resulting use cases will be to accomplish the task. The acceptance criteria specify the requirements that must be met to satisfactorily complete the task.

2.5.1 Manage Student Enrollment Records

User Story: As the Dean, I want to maintain consolidated, detailed, and up-to-date student enrollment records to increase the administration's efficiency and accuracy.

Acceptance Criteria:

1. Ability to import data on student enrollment, housing, and major updates
    - Translate degree codings from IAS into major names upon import
2. Distinguish students as direct admits or first-year admits
3. Track reasons for student departure – withdrawal, dismissal, transfer
4. Ability to search for and view/edit a single student's record
5. Ability to view students by University admittance term
6. Ability to view all active students across all academic classes
7. Ability to view students by housing type (living in honors housing, living in non-honors housing, or commuting)
8. Track enrollment changes

Use Cases	Data Collection	Triggers
• Import incoming freshmen • Import first-year freshmen • Search for a student • View students by class • View active students • Update student majors • View enrollment changes • Import housing placements • View students by housing type	• Incoming freshmen enrollment • First-year admitted students • Housing placements • Semester GPAs • Semester honors credits • Student majors from IAS • Enrollment changes	• Students are admitted to the Honors College • Students are assigned housing • Beginning of semester (for updating student majors) • Final course grades released • Dean needs to update a student's record

2.5.2 Review Student Academic Records

User Story: As the Dean, I want to accurately and efficiently review student academic records to ensure students are meeting GPA, honors credits, and departmental honors program enrollment requirements, and decide on appropriate actions should students not meet the requirements.

Acceptance Criteria:

1. Ability to import data on student GPAs and honors credits earned
2. View students not meeting academic requirements by class
    - Freshman Requirements
        - Direct admits: 3.30+ cumulative GPA
        - First-Semester Admits: 3.5+ spring semester GPA
    - Sophomore Requirements
        - All students: 3.5+ semester GPA

- Junior and Senior Requirements
    - All students: 3.5+ semester GPA, enrollment in departmental honors program (if one exists for their major)
    - Direct Admits: 18+ honors credits
    - First-Year Admits: 12+ honors credits

3. View students who earned zero honors credits in a semester, except those who already earned 12/18 credits
4. View students who received a D+, D, D-, or E in an honors course for a given semester
5. View list of students who received a 4.0 GPA for a given semester
6. View list of students on probation
7. Flag students who are studying abroad or on a leave of absence

Use Cases	Data Collection	Triggers
• Add GPAs • Add honors credits • Review Freshman Performance • Review Sophomore Performance • Review Junior/Senior Performance • View students not taking honors courses • View failing grades • View students with a 4.0 GPA • View students on probation	• Semester GPAs and credits earned from IAS • Students abroad or on leave of absence	• Final course grades released

2.5.3 Track Graduation Requirements Completion

User Story: As the Dean, I want to track enrollment in departmental honors programs and thesis completion to ensure seniors have met all the requirements to graduate from the Honors College.

Acceptance Criteria:

1. View lists of students by major
2. Flag students that should be enrolled in a departmental honors program based on their major
3. Ability to add thesis and future plans records
4. Verify that graduating seniors have met all the graduation requirements (GPA, honors credits, departmental program enrollment, thesis completed)

Use Cases	Data Collection	Triggers
• View students by major • Add program enrollment • Add thesis • Add future plans • View graduating seniors	• Program enrollment from directors • Thesis information • Future plans survey	• All theses collected • All future plans collected • Enrollment received from directors • End of semester (for verifying graduation requirements)

2.5.4 Honors Course Planning

User Story: As the Dean, I want to maintain a historical record of honors courses offered to aid in future course planning.

Acceptance Criteria:

1. Create an honors course catalog
2. View past courses offered by semester
    - Count number of 3/4 credits and 1 credit courses, number of distinct departments, and number of distinct professors offering courses each semester
3. View past courses offered by department
4. View past courses offered by professor
5. View past courses offered by general education requirement fulfilled
6. Maintain contact information for current and past honors professors

Use Cases	Data Collection	Triggers
• Add course • Add professor • Add gen ed requirement • Add course offering • View course catalog • View professor directory • View courses by semester • View courses by department • View courses by professor • View courses by gen ed req filled	• Internal course planning	• Begin course planning • Course schedule is finalized

2.5.5 Track Honors Event Attendance

User Story: As the Dean, I want to maintain a historical record of honors event attendance to measure students' engagement and identify those who are maintaining the honors housing privilege.

Acceptance Criteria:

1. Ability to import the number of honors events each student attended for a given semester
2. Ability to update the number of honors events each student attended for a given semester
3. View list of student attendance records for a given fall semester and following spring term

Use Cases	Data Collection	Triggers
• Add semester event attendance • Update semester event attendance • View event attendance by year	• Event attendance	• Request from Residential Life for housing qualifiers • Semester ends

2.6 System Features

After identifying the user stories, acceptance criteria, and resulting use cases, the system's features can be established and grouped together. A system's features include functional and non-functional requirements. Functional requirements include the activities the system will need to perform; non-functional requirements are additional system characteristics, such as usability, reliability, performance, and security requirements (Satzinger et al., 2016).

The functional requirements aim to fulfill the acceptance criteria for each user story. Most of the functionalities are implemented through a combination of user interfaces designed on forms that include query results displayed in subtables. The success of all the requirements was evaluated by the author throughout the implementation process, during which all historical Honors College data was imported into the database and each query was tested to verify accurate data was being returned. Duplicate data was also entered into the database to ensure validation errors were thrown to avoid duplicate entries.

2.6.1 Functional Requirements

The functional requirements for the Honors College SIS are divided into seven subsystems: 1) Student Enrollment, 2) Academic Performance, 3) Course Management, 4) Departmental Honors, 5) Theses & Future Plans, 6) Event Attendance, and 7) System Updates. Table 5 captures the events, triggers, and required system responses that occur within each subsystem related to these functionalities.

1) Student Enrollment

- Import new student enrollment information, housing placements, and major changes
    - Convert imported degree codes into major names
- View student information by academic class
- View all active students across all academic classes

- View a single student profile at a time. The profile should include demographic information, major(s), enrollment status, semester GPAs, honors credits, housing placement, departmental honors program enrollment, thesis, and future plan information
- Record when a student profile was last updated
- View list of students with enrollment changes within a given period
- Filter student class list by housing type (honors, non-honors, or commuter)

2) Academic Performance

- Import students' semester GPA, updated cumulative GPA, and honors credits earned after final course grades are released at the end of each semester
- Edit GPA and honors credits earned by semester via query
- Review academic performance by class, filtering data to those students not meeting the class's current academic requirements (ex. freshmen need a cumulative 3.30 GPA vs. all upperclassmen need 3.5 GPA each semester)
- View a list of students who have taken zero honors courses in a semester (except students who have already completed the 12/18 credit requirement)
- View a list of students who have earned a failing grade for an honors course during a given semester (ex. a grade of D+, D, D-, E)
- View a list of students who earned a 4.0 GPA for a given semester
- Flag and view students who are on probation, studying abroad, or on academic leave
- Verify graduating seniors have met all graduation requirements via query

3) Course Management

- Add new courses to the honors course catalog
- Add new honors professors
- Add new honors course offerings each semester
- View honors course catalog
- View honors professor directory
- Provide course offering views, including courses by department, by semester, by general education requirement fulfillment, and by professor

4) Departmental Honors

- View lists of students by major
- Add new departmental honors program
- Associate majors with a departmental honors program
- View and update departmental honors program director contact information
- Add student enrollment in a departmental honors program
- Flag students whose major does not have a departmental honors program

5) Theses & Future Plans

- Add students' theses and future plans information via data entry forms
- Filter theses by department or semester
- Filter future plans by students attending graduate school, entering the workforce, volunteering, or participating in a fellowship program

6) Event Attendance

- Import semester honors event attendance
- Update semester event attendance
- View event attendance by semester
- View a list of student attendance for a selected fall term and the following spring term

7) System Updates

- Add new degrees, majors, departments, and schools
- Edit existing degrees, majors, departments, and schools
- View list of degrees
- Add term IDs and term names
- Edit term IDs and term names
- Add new general education requirement
- Edit general education requirement

Table 5. Event Table

Student Enrollment Subsystem					
Event	**Trigger**	**Source**	**Use Case**	**Response**	**Destination**
Add incoming freshmen records	Dean receives data extract with freshmen records	Admissions	Import Incoming Freshmen	Import data and append records; label students as direct admit	N/A
Add new first-year student records	Dean admits first and second semester freshmen	Dean	Import First-Year Freshmen	Import data and append records; label students as first-year admit	N/A
Add freshmen housing placements	Dean receives data extract with housing placements	Residential Life	Import Housing Placements	Import data and append records	N/A
Update an individual student's record	Enter student's name or UAlbany ID number into the search bar	Dean/ Student Assistant	Search for a Student	Individual student's information is displayed on the form	N/A

View an entire class's records	Select class admit term from the dropdown on the form	Dean/ Student Assistant	View Students by Class	Student records filtered to selected admit term	Dean/ Student Assistant
View all active students	User selects "View Active Students" button	Dean/ Student Assistant	View Active Students	Student records filtered to active students	Dean/ Student Assistant
Update students' majors	Beginning of the semester; query majors from IAS	IAS Database	Update Student Majors	Import data and update major field	N/A
Send honors advisors any enrollment changes	End of week	Dean/ Student Assistant	View Enrollment Changes	A list of enrollment changes made during the current week and month is generated	Honors Advisors
Academic Performance Subsystem					
Event	**Trigger**	**Source**	**Use Case**	**Response**	**Destination**
Update student GPAs and credits earned	Course Grades Released	IAS Database	Add GPAs; Add Honors Credits	Import data and append to tables	N/A
Dean needs to review students who did not meet GPA or honors credit requirements	GPAs and credits updated	Dean	Review Freshman Performance; Review Sophomore Performance; Review Junior/Senior Performance	Student records filtered to those not meeting at least one academic requirement	Dean
Verify graduates have met all requirements before emailing their names to the Registrar	End of semester	Dean	View Graduating Seniors	Student records are filtered to those who have met all graduation requirements	Dean
Distribute 4.0 mugs after the semester ends	Course Grades Released	Dean	View students with a 4.0 GPA	Student records are filtered to those who earned a 4.0	Dean
Update students on probation, studying abroad, or on a leave of absence	GPAs and credits updated	Dean	View Students on Probation; View Students Studying Abroad; View Students on Leave of Absence	Student records are filtered to active students who do not have a null probation term, abroad term, or leave term	Dean

Course Management Subsystem					
Event	**Trigger**	**Source**	**Use Case**	**Response**	**Destination**
Add new course offerings to the database	The honors course schedule for the upcoming semester has been finalized	Dean/ Student Assistant	Add Course offering; Add Professor; Add Course; Add Gen Ed Requirement	Open form to add course offerings	N/A
View the entire course catalog	User selects 'View Catalog' option from menu	Dean/ Student Assistant	View Course Catalog	Open table with all honors courses	Dean/ Student Assistant
View professor directory	Need a professor's contact information	Dean/ Student Assistant	View Professor Directory	Open table with all professors' contact information	Dean/ Student Assistant
View past courses a professor has offered	User selects a professor on the form	Dean/ Student Assistant	View Courses by Professor	A list of courses a professor has taught is generated	Dean/ Student Assistant
View courses offered during a specific semester	User selects a semester on the form	Dean/ Student Assistant	View Courses by Semester	A list of courses offered during a certain semester is generated	Dean/ Student Assistant
View past courses offered by a department	User selects a department on the form	Dean/ Student Assistant	View Courses by Department	A list of courses offered by a department is generated	Dean/ Student Assistant
View past courses offered by general education requirement fulfillment	User selects a gen ed on the form	Dean/ Student Assistant	View Courses by Gen Ed Req.	A list of courses offered by gen ed is generated	Dean/ Student Assistant
Departmental Honors Subsystem					
Event	**Trigger**	**Source**	**Use Case**	**Response**	**Destination**
Create lists of students by major for departmental honors program directors	Beginning of semester	Dean/ Student Assistant	View Students by Major	Filter student records based on selected major	Dean/ Student Assistant
Add departmental honors program enrollment	Director emails list of students enrolled	Honors Program Director	Add Program Enrollment	Open form to input program enrollment	Dean/ Student Assistant

Add new departmental program information	A new departmental program created	Academic Department	Add Departmental Program; Associate Major with Program	Open form to input department information	N/A
Look up a department program contact	Need contact information	Dean/ Student Assistant	View Department Contact Info	Open table with department contact information	Dean/ Student Assistant
Theses & Future Plans Subsystem					
Event	**Trigger**	**Source**	**Use Case**	**Response**	**Destination**
Add new thesis information	Dean has collected seniors' theses information	Dean/ Student Assistant	Import Theses	Import data and append to table	N/A
Add new future plans information	Dean has collected seniors' future plans surveys	Dean/ Student Assistant	Import Future Plans	Import data and append to table	N/A
Add new future plans information	Dean has collected seniors' future plans surveys	Dean/ Student Assistant	Import Future Plans	Import data and append to table	N/A
View theses completed by department	Want to view theses in a specific department	Dean/ Student Assistant	View Theses by Department	Filter thesis records by selected department	Dean/ Student Assistant
View alumni future plans by those attending grad school, entering work force, volunteering, or completing a fellowship	Want to view alumni connections	Dean/ Student Assistant	View Future Plans by Type	Filter student information by future plan type	Dean/ Student Assistant
Event Attendance Subsystem					
Event	**Trigger**	**Source**	**Use Case**	**Response**	**Destination**
Add attendance records for a given semester	ResLife inquiries about housing qualifiers	Dean/ Student Assistant	Add Semester Event Attendance	Import data and append to table	N/A
Add attendance records for a given semester	ResLife inquiries about housing qualifiers	Dean/ Student Assistant	Add Semester Event Attendance	Import data and append to table	N/A
Update attendance records for a given semester	Semester ends	Dean/ Student Assistant	Update Semester Event Attendance	Update attendance value	N/A

Create a list of students who qualify to sign up for honors housing to Res Life	Attendance records have been imported	Dean/ Student Assistant	View Event Attendance by Year	A list with each student's fall and spring semester attendance records is generated	Dean/ Student Assistant
System Updates Subsystem					
Event	**Trigger**	**Source**	**Use Case**	**Response**	**Destination**
Add new academic program information	A new degree, major, department, and/or school is created	The University	Add Degree; Add Major; Add Department; Add School /College	Open a form to input new academic program information	N/A
Edit academic program information	Change in University's academic program structure	The University	Edit Degree; Edit Major; Edit Department; Edit School /College	Open form to search for a specific component and edit	N/A
Add new terms to the database	Reach new term that is not in the database	The University' s term coding system	Add Term	Open form to input new term ID and description	N/A
Add or edit general education requirements	The University changes general education categories	The University	Add Gen Ed, Edit Gen Ed	Open for add/edit general education requirement information	N/A

2.6.2 Usability Requirements

Usability requirements include attributes that enhance the end user's interaction with the system, such as user interfaces and documentation. The following will be necessary to ensure a productive user experience:

- Navigation buttons on each form
- Text boxes on each form with instructions on how to use the combo boxes to run and filter the query results
- Excel sheet templates to use for data imports; include a summary sheet with instructions on how to import the data
- Detailed documentation and instructions for the entire SIS

2.6.3 Reliability Requirements

Reliability requirements address a system's dependability, such as how a system identifies and responds to errors. The following will help prevent processing errors and alert the user of any difficulties:

- Error messages for key validation errors if a data import will create duplicate entries in a table
- Enforce referential integrity to avoid orphan rows
- Use combo boxes on forms to control inputs where applicable (ex. select a term ID or course name from the combo box)

2.6.4 Performance Requirements

Performance requirements describe the system in terms of speed and throughput. The implementation of the following requirements will be essential to ensuring the Honors College administration can efficiently use the system to complete their jobs:

- Create a front- and back-end to the database so multiple users can use the system at once
- Use linked Excel worksheets to import a maximum of approximately 500 records at a time
- Enable "Compact and Repair Database" setting upon file closure to maintain the system's speed and prevent the file size from rapidly increasing after each use

2.6.5 Security Requirements

Security requirements include how the system and its data will be stored and protected. These requirements are crucial to ensuring the system's data is not lost and that the student information within the system is protected:

- Store the Access database file on the University's V: drive. Only authorized faculty within the University have access to the V: drive, which is only accessible via the University's VPN on designated computers

- Password-protect the Access file so only authorized Honors College administration members can open the file
- Create two different front-ends to the database; one for the Dean and other administrators, and one for the student assistants. The student assistant version will not have access to forms or queries that involve student academic records
    - Each front-end will have its own unique password
- Routinely create a backup of the database on the V: drive and external drive
- Do not store a backup of the database on the Honors College OneDrive. The University does not control file sharing on OneDrive, and the database could be easily shared with unauthorized users

2.7 Use Cases

The functional requirements of a system can be depicted visually with use case diagrams, illustrating which user is associated with each use case. Since currently, the Dean and the student assistants are the only users of this system and have many use cases in common, the use case diagrams for the student information system are relatively simple. For each subsystem, a summary of the related functionalities, a table of use case descriptions, and a use case diagram are provided. Additionally, process flow diagrams have been included to depict the sequence of events required to carry out specific use cases where applicable.

2.7.1 Student Enrollment Subsystem

The Student Enrollment Subsystem encompasses all activities related to importing and updating student enrollment, housing, and major information in the SIS. The Honors College receives the initial list of incoming honors freshmen from the Admissions Office and will import this data into the SIS to establish a record for each student. Residential Life will then email a list of freshmen housing placements, which is also imported into the database so it can be tracked whether incoming students are living in honors housing, non-honors housing, or off-campus.

During the semester, the Dean will need to update student records for both major and enrollment changes. A list of current academic degree plan codes will be extracted from IAS at the beginning of each semester, imported into the SIS, and automatically decoded to the student's major. Additionally, a list of enrollment changes made each week will be queried and emailed to the honors advisors so they can ensure their own records are up to date.

At the end of each semester, the Dean will admit approximately 30-40 additional freshmen into the Honors College and will need to create new enrollment records in the SIS. It will be important to note that these are first-year admits, as different honors credit requirements will apply to them. In the linked Excel sheet, there will be separate sheets for importing direct admits and importing first-year admits, ensuring the students are correctly flagged.

Table 6. Student Enrollment Use Cases Descriptions

Use Cases	Description
Import incoming freshmen	User runs append query to import student records; system flags students as direct admits
Import first-year freshmen	User runs append query to import student records; system flags students as first-year admits
Search for a student	User enters student's UAlbany ID or name in the search bar to open student information form
View students by class	Student records are filtered by their University admittance term; records may be edited/deleted in this view
View all active students	Student records are filtered to those whose enrollment status is "Active"
Update student majors	User runs update query that decodes degree plan and updates students' majors
View enrollment changes	Student Information records are filtered to those whose enrollment status has changed to "Withdrew," "Dismissed," "Transferred," or "Graduated." Views include changes from the current week, current month, and all-time historical record
Import housing placements	User runs append query to import student housing placements
View students by housing type	Student records are filtered by their freshman housing type; filter options include students living in honors housing, students living in non-honors housing, or commuters; records may be edited/deleted in this view

Figure 3. Student Enrollment Use Case Diagram

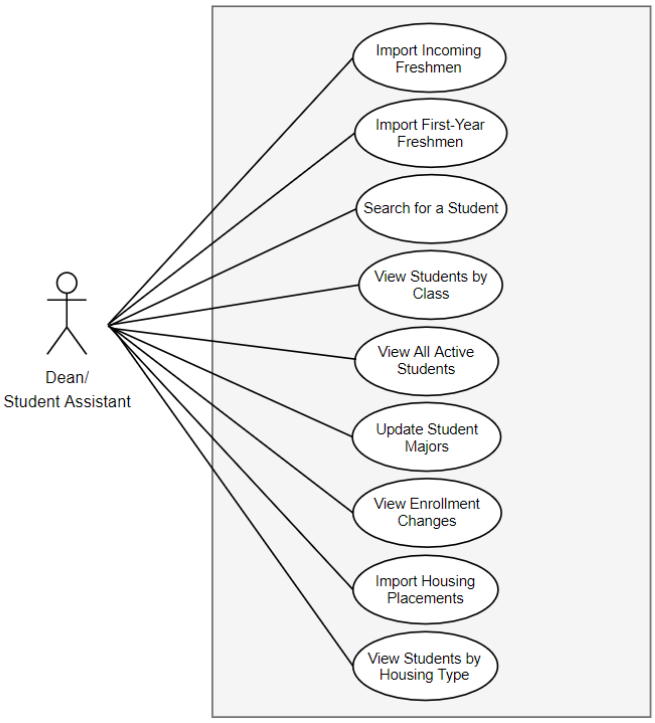
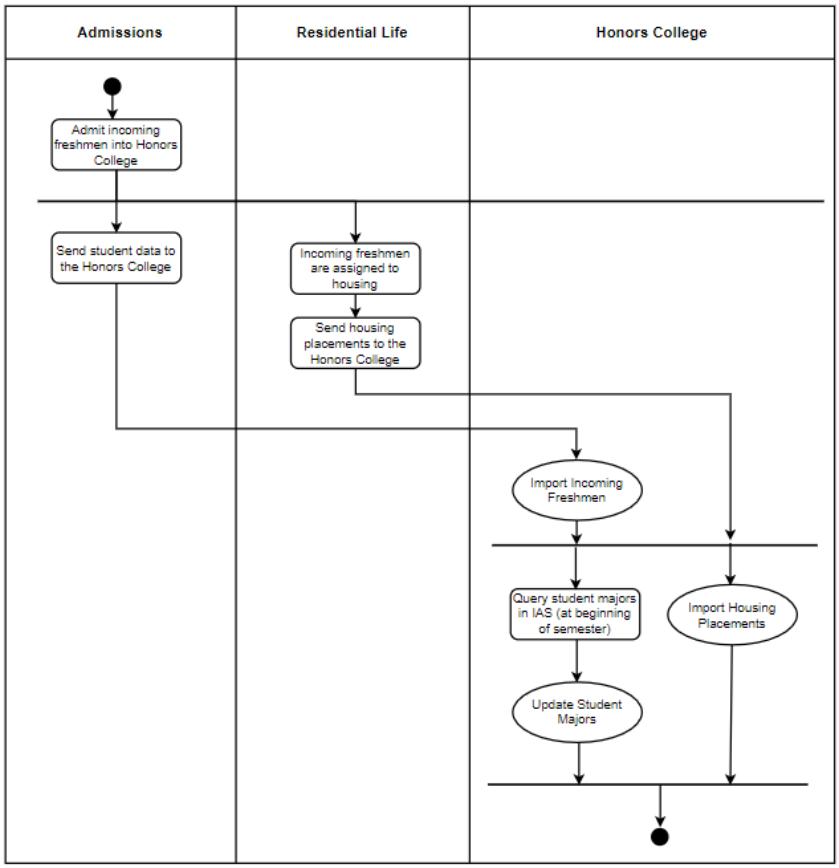


Figure 4. Student Enrollment Process Flow



2.7.2 Academic Performance Subsystem

The Academic Performance Subsystem includes events related to reviewing students' academic performance and ensuring graduates of the Honors College have met all the requirements. At the end of each semester, the Dean queries students' semester GPAs and honors credits earned from the IAS database. Then, students not meeting either the GPA or honors credit requirement are reviewed and put on probation or dismissed. Additionally, with the support of the new system, students' enrollment in departmental honors programs will be tracked, and a lack of enrollment can be taken into consideration when making probation and dismissal decisions. To support this functionality, majors that do have a departmental honors program are flagged in the system.

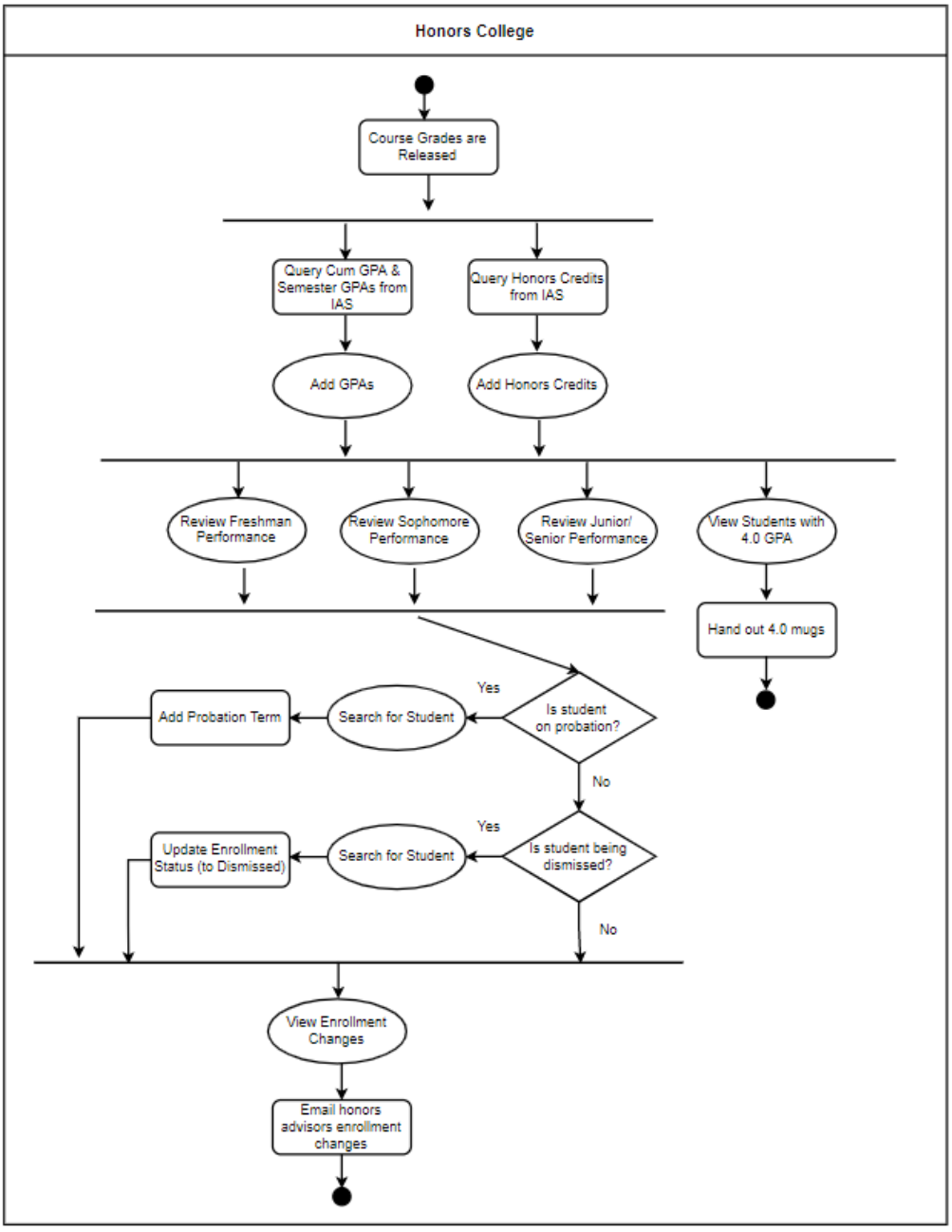
Students' academic data will be imported into the SIS at the end of each semester, as a historical record of student GPAs and honors credits earned will be needed in the future to determine whether each student has met graduation requirements. Additionally, students must complete their honors thesis and departmental honors program requirements to graduate from the Honors College. Therefore, this subsystem is reliant on the Departmental Honors and Theses & Future Plans subsystems, as these subsystems capture whether these requirements have been met. A list of students who have met all the requirements is emailed to the Registrar's office after classes end.

Table 7. Academic Performance Use Case Descriptions

Use Cases	Description
Add GPAs	User runs a macro to append semester GPAs and update cumulative GPAs
Edit GPAs by semester	GPA records filtered by semester
Add honors credits	User runs append query to import student honors credits earned for a semester
Edit honors credits by semester	Honors credit records filtered by semester
Review freshman performance	Student records filtered by selected admit term and those not meeting at least one of the freshman requirements outlined in Section 2.5.2
Review sophomore performance	Student records filtered by selected admit term and those not meeting at least one of the sophomore requirements outlined in Section 2.5.2
Review junior/senior performance	Student records filtered by selected admit term and those not meeting at least one of the junior/senior requirements outlined in Section 2.5.2
View graduating seniors	Generates a list of students who have met all honors graduation requirements
View students not taking honors courses	Generates a list of students that earned a GPA for a given semester but did not earn any honors credits; students with 12/18 honors credits are excluded
View failing grades	Generates a list of students and any courses they earned a D+, D, D-, or E in during a given semester
View students with a 4.0 GPA	Generates a list of students that earned a 4.0 semester GPA for the selected term
View students on probation	Generates a list of students flagged as on probation
View students studying abroad	Generates a list of students flagged as abroad
View students on leave of absence	Generates a list of students flagged as on leave

Figure 5. Academic Performance Use Case Diagram

Figure 6. Academic Performance Process Flow



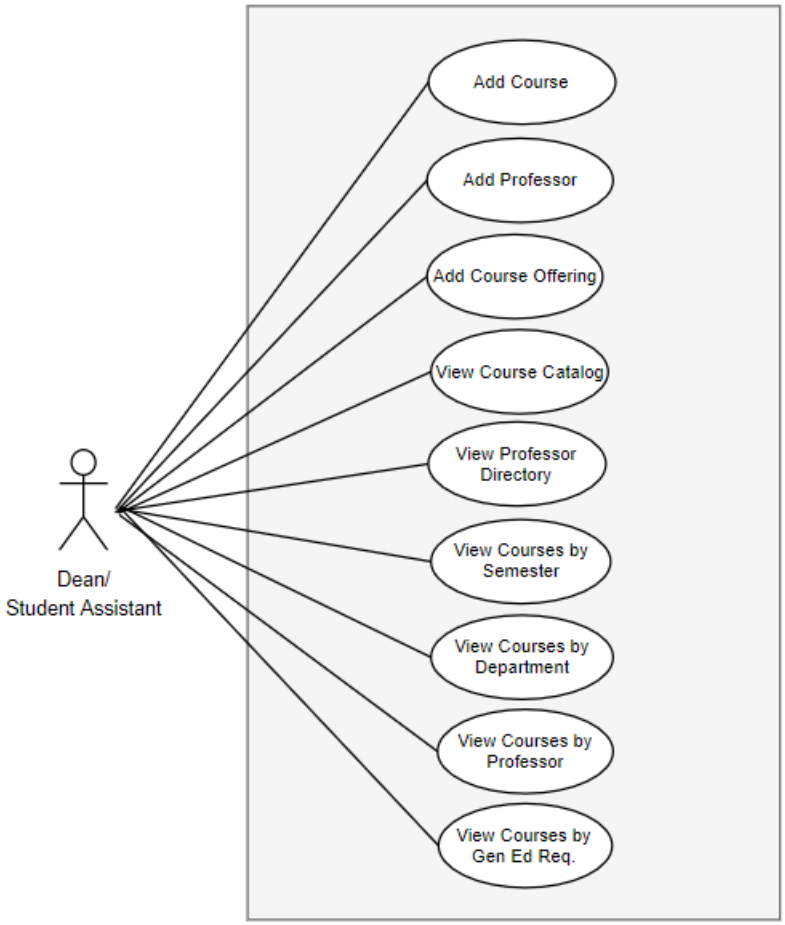
2.7.3 Course Management Subsystem

The Course Management Subsystem is designed to create a catalog of honors courses and create the ability to view past course offerings by semester, department, professor, and general education requirement fulfillment. This will assist the Dean with future course scheduling and monitor the variety of course offerings available to students. The course offerings by semester view will also include a count of 3/4 credits and 1 credit courses offered, number of distinct departments offering courses, number of professors teaching, and number of courses fulfilling at least one general education requirement. This data is useful for the Honors College annual report for marketing purposes.

Table 8. Course Management Use Case Descriptions

Use Case	Description
Add course	Opens form to create a new honors course (using Catalog Number and Course Name)
Add professor	Opens form to input new professor contact information
Add Course Offering	Opens form to add new course offering during a semester
View Course Catalog	Opens table with all honors course names and catalog numbers
View Professor Directory	Opens table with all current and past honors professors and their contact information
View Courses by Department	Filters course offerings by selected department
View Courses by Semester	Filters course offerings by selected term
View Courses by Gen Ed Req	Filters course offerings by selected general education requirement
View Courses by Professor	Filters course offerings by selected professor

Figure 7. Course Management Use Case Diagram



2.7.4 Departmental Honors Subsystem

The Departmental Honors Subsystem's purpose is to record enrollment in each departmental honors program and record contact information for each program director. To help students establish a connection to their departments, the Honors College sends a list of freshmen and sophomore students within each department to the honors program director. In return, the directors will be asked for a list of current students enrolled in their program. Students who are not in the Honors College may apply to and enroll in departmental honors programs, so some students on the list may not be in the database. Juniors and seniors not enrolled in a program may be dismissed.

When a new departmental honors program is established, it is important to make sure the appropriate majors are flagged as now having an honors program. The “Associate major with departmental program” use case accomplishes this, updating the program flag in the major table.

Table 9. Departmental Honors Use Case Descriptions

Use Case	Description
View students by major	Generates a list of student names and emails whose primary or secondary major matches the select major filter
Add program enrollment	Opens form to associate a student with a departmental program
View program enrollment	Generates a list of active students enrolled in the selected honors program
Add departmental program	Opens a form to enter new departmental program information
Associate major with departmental program	Opens form to update a major’s departmental program flag
View program contact information	Opens table containing the honors program directors’ contact information

Figure 8. Departmental Honors Use Case Diagram

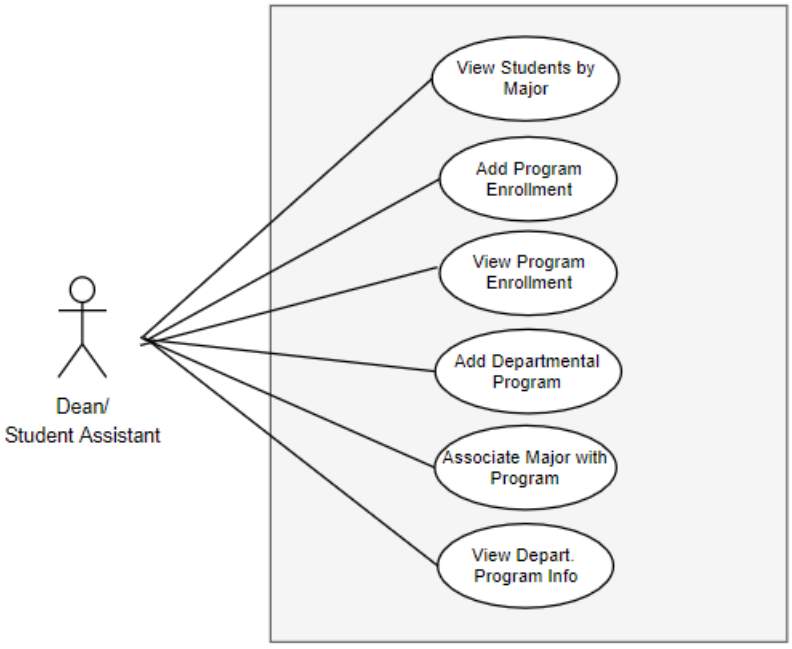
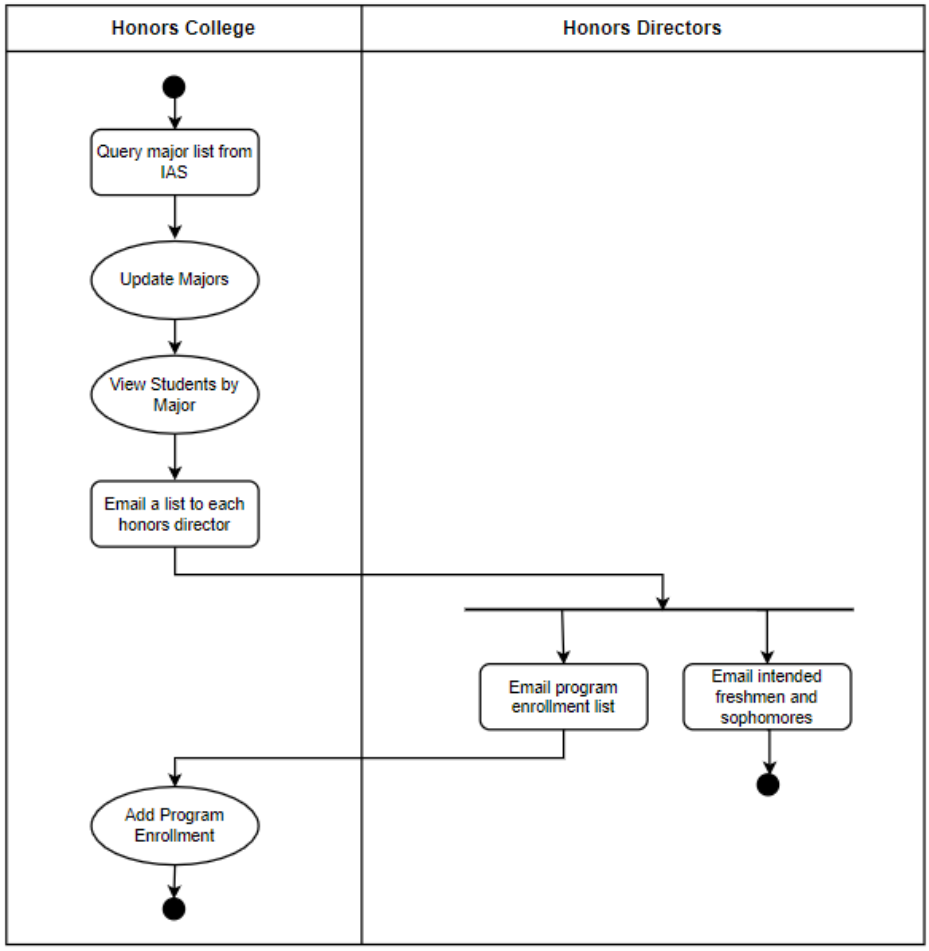


Figure 9. Departmental Honors Process Flow



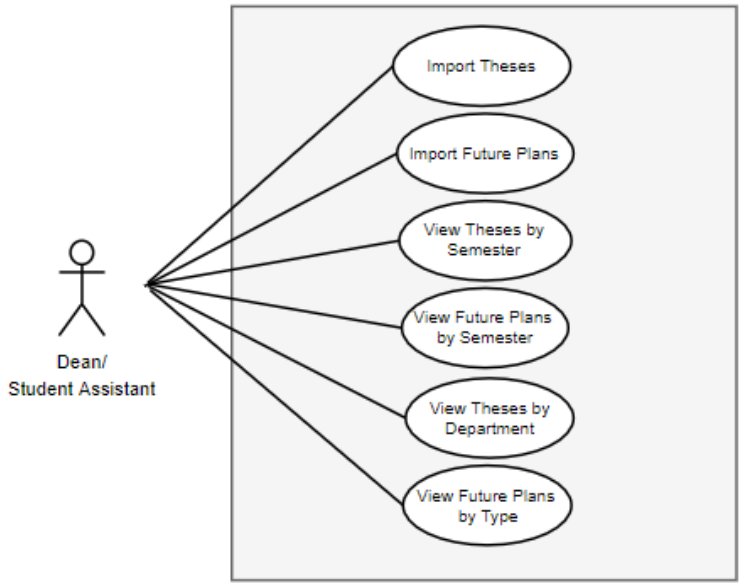
2.7.5 Theses & Future Plans Subsystem

Throughout the duration of the semester, information about each graduating senior's thesis is collected. Each thesis's title, keywords, and advisor information are required to upload the thesis to Scholar's Archive. Once all the theses have been collected and uploaded, the thesis records can then be imported into the database so it can be confirmed whether the seniors have met all of the honors graduation requirements. Seniors are also asked to fill out a future plans survey, which provides information on whether the student will be attending graduate school, entering the workforce, volunteering, or completing a fellowship. This information is valuable to the Honors College, as it can help strengthen connections between current students and alumni if students are interested in specific graduate programs or fields that honors alumni are involved in.

Table 10. Theses & Future Plans Use Case Descriptions

Use Case	Description
Import theses	User runs append query to import thesis records
Import future plans	User runs append query to import future plan records
View theses by semester	Filters thesis records by selected semester
View future plans by semester	Filters future plan records by selected semester
View theses by department	Filters thesis records by selected department
View future plans by type	Filters future plans by type (graduate program, company, volunteer program, fellowship)

Figure 10. Theses & Future Plans Use Case Diagram



2.7.6 Event Attendance Subsystem

The Event Attendance Subsystem tracks students' honors events attendance by semester. This is used to determine which students qualify to sign up for honors housing, which usually requires attending at least seven honors events each semester. However, given the variability in the number of events that may be required over time, the system will query a list of students' attendance for a select fall semester and the following spring. The Dean can then export this list

and decide how to filter the data based on her chosen event attendance requirements. Since Residential Life needs the list of housing qualifiers mid-semester, the names of students who are one or two events short of meeting the requirement are still submitted under the condition they attend enough events by the end of the semester. Therefore, the event attendance will need to be updated after the last event of the semester to ensure the students who were granted honors housing fulfilled the requirement.

Table 11. Event Attendance Use Case Descriptions

Use Cases	**Description**
Add semester event attendance	User runs append query to import event attendance
Update event attendance	User runs update query to update event attendance
View attendance by semester	Filters attendance records by selected semester
View attendance by year	Generates a list of student names and UAlbany IDs with their fall and spring event attendance

Figure 11. Event Attendance Use Case Diagram

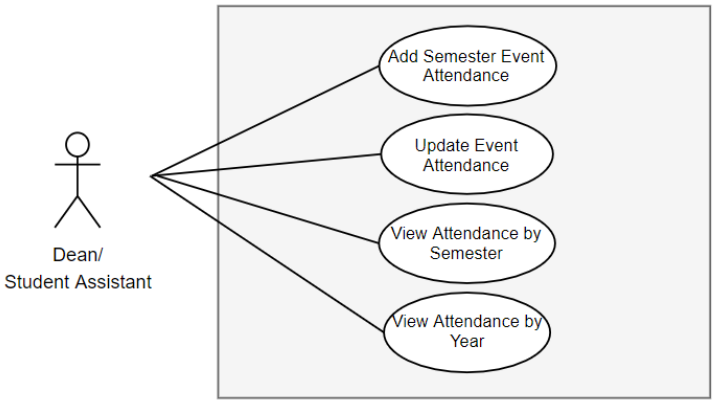
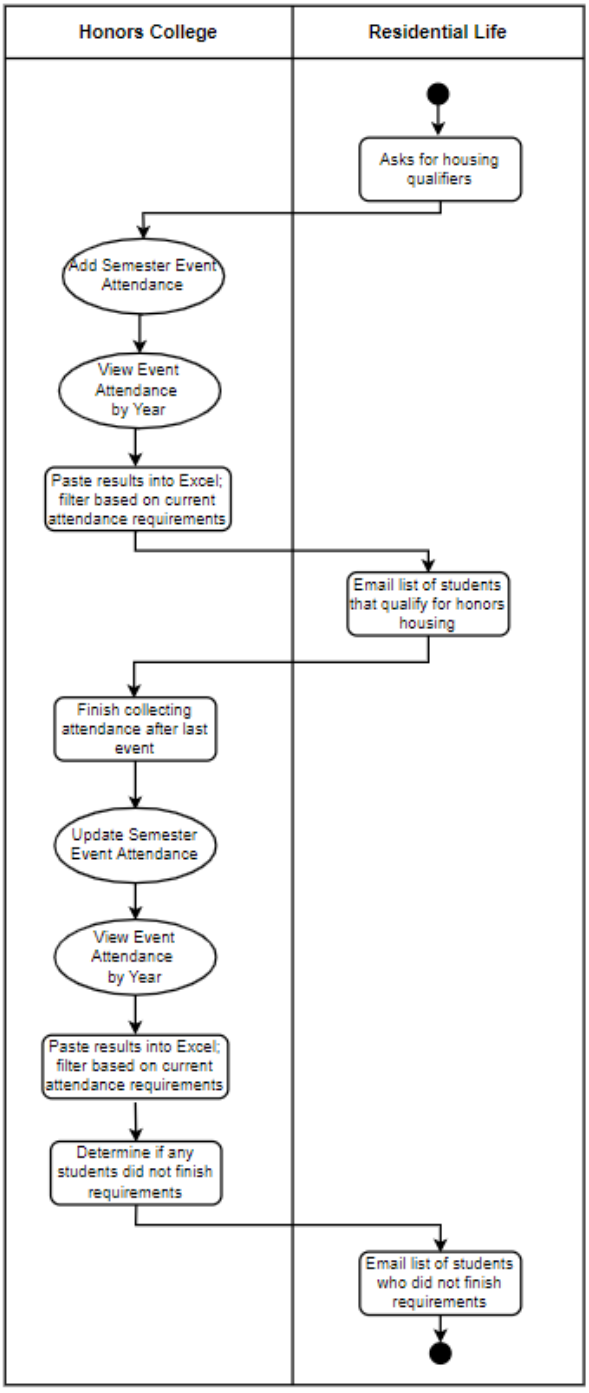


Figure 12. Event Attendance Process Flow



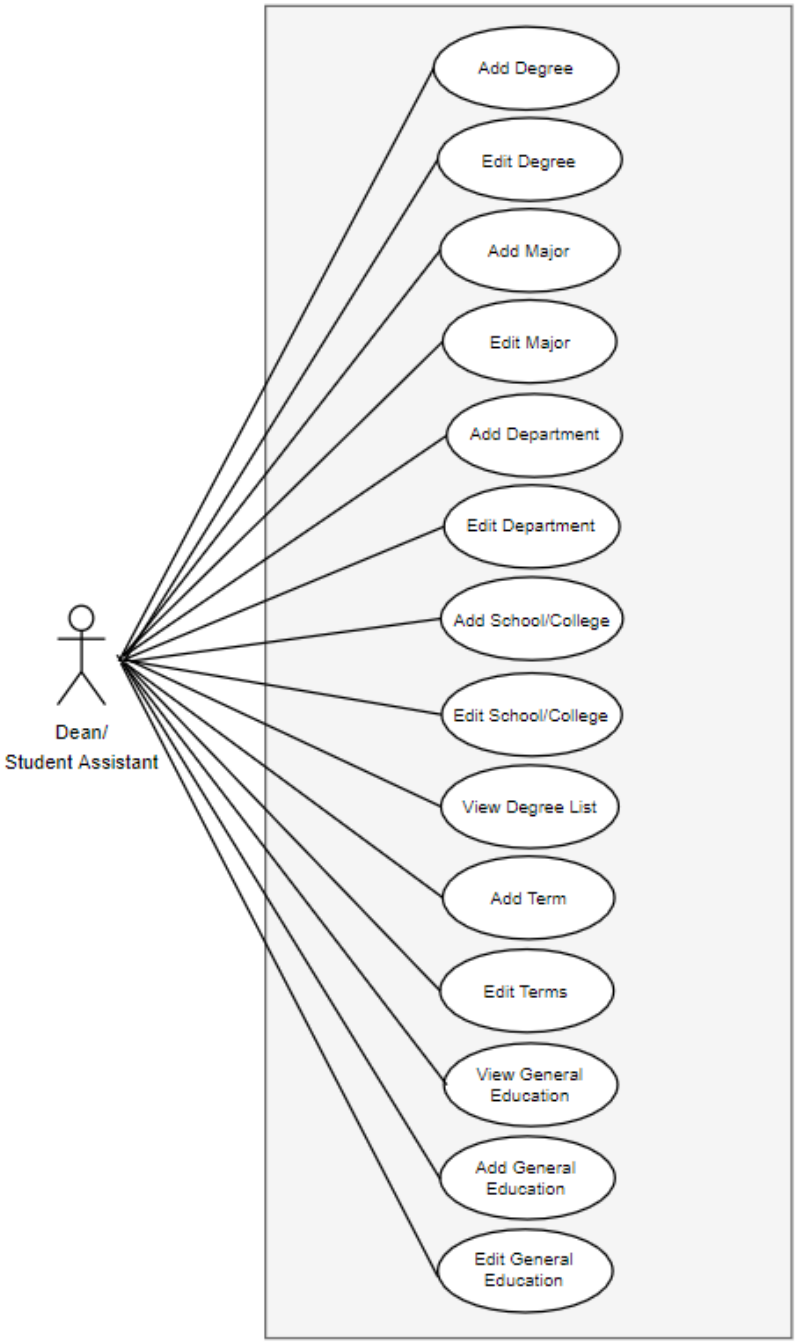
2.7.7 System Updates Subsystem

The System Updates Subsystem ensures the longevity of the student information system's use. Over time, the University will likely add new schools/colleges, departments, majors, and degrees. It is also possible that some majors could be reassigned to a different department or school. These changes will need to be recorded in the database, as this data is integrated with student majors, departmental honors programs, thesis completion, and honors course offerings. Additionally, new term ID codes will eventually need to be added to the system. Currently, the term ID codes through Fall 2030 are in the system.

Table 12. System Updates Use Case Descriptions

Use Cases	Description
Add degree	Opens form to enter new degree information and associate it with a major
Edit degree	Opens form to edit degree and switch major association
Add major	Opens form to enter new major information and associate it with a department
Edit major	Opens form to edit major and switch department association
Add department	Opens form to enter new department information and associate it with a school/college
Edit department	Opens form to edit department and switch school/college association
Add school/college	Opens form to enter new school/college information
Edit school/college	Opens form to edit school/college
View degree list	Opens table to view the master list of all degrees and their major, departmental, and school/college association
Add term	Opens form to enter new term and term ID information
Edit term	Opens form to edit term
Add gen ed	Opens form to enter new general education requirement information
Edit gen ed	Opens form to select and edit a general education requirement
View gen eds	View table with general education name and last active term

Figure 13. System Updates Use Case Diagram



2.8 Entity Relationship Diagram

This section includes the student information system's Entity Relationship Diagram (ERD), which visualizes the data entities, their respective attributes, and the relationships between the entities present within the system's domain. The relationships are documented using Crow's Feet notation, except for the term relationships, which have been omitted for simplicity.

The Student Table is one of the most important tables in the database. Its primary key is the students' UAlbany ID numbers, which are assigned by the University. The Dean first receives the students' UAlbany ID numbers when Admissions sends the list of incoming honors freshmen. Students who apply to the Honors College after their first or second semester on campus are required to provide their UAlbany ID on the application form.

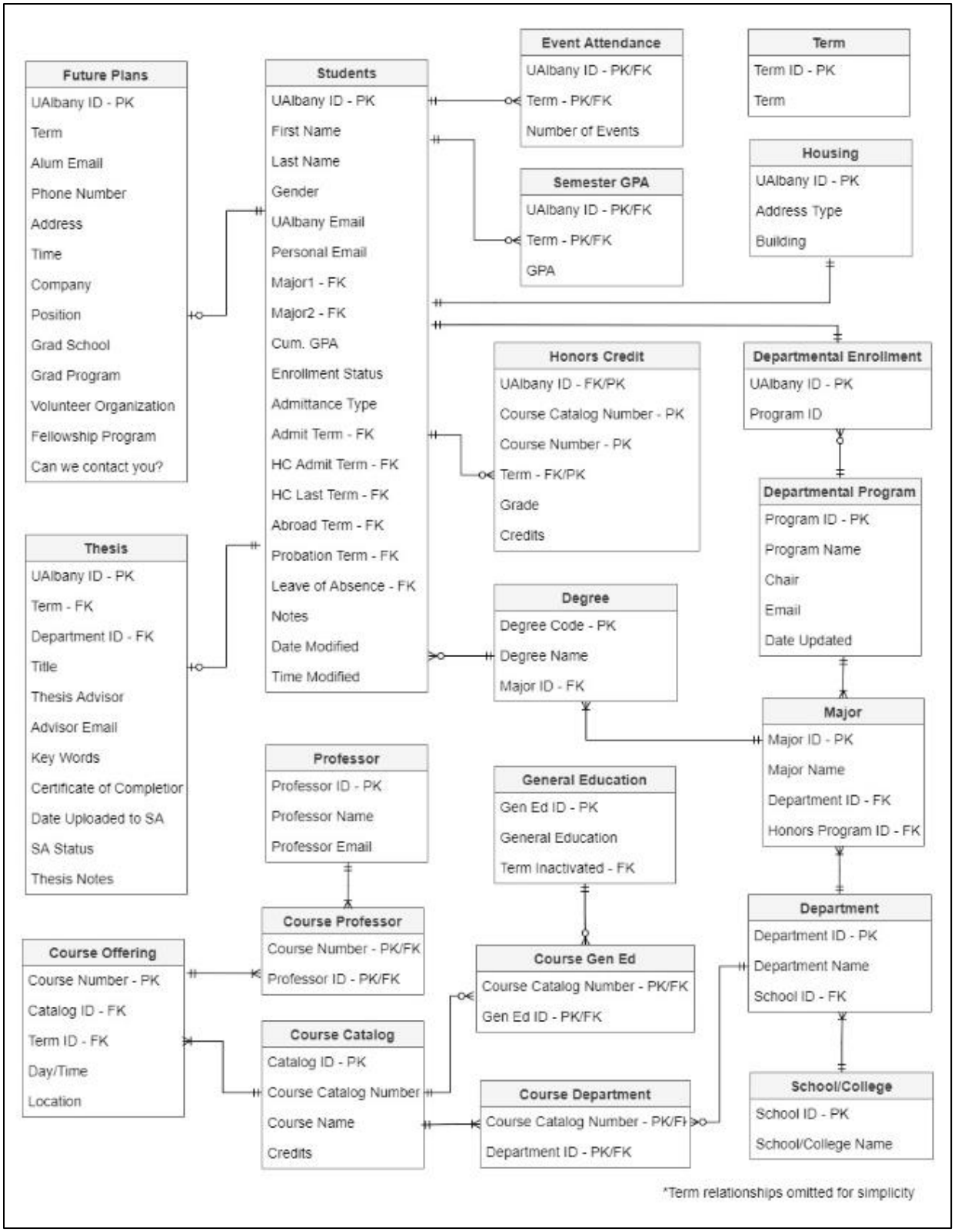
Once a student's UAlbany ID is in the system, the student can then be associated with other entities within the database. UAlbany ID is used as a foreign key in several other tables, including Semester GPA, Honors Credits, Event Attendance, Thesis, Future Plans, and Housing. A student may have multiple records in the Semester GPA, Honors Credits, and Event Attendance tables, as the data collection for these entities happens on a semester basis. Since each student will only write one honors thesis and submit one future plans survey, these tables each have a one-to-one relationship with the Student table. The Housing table also has a one-to-one relationship, as only freshmen housing placements are received from Residential Life.

A second key table in the ERD is the Course Catalog table. This table stores data on each honors course that has been offered. For example, a row in the Course Catalog table might be "1; TPSY 102; Advanced Introduction to Psychology; 4." The Catalog ID, 1, is an auto number used within the SIS and has no meaning outside of the system. The Course Catalog Number, "TPSY 102", and Course Name, "Advanced Introduction to Psychology", are how they would appear in the University's course catalog. To see which terms a course was offered, the Course Catalog

table can be queried with the Course Offering table. Since multiple professors may teach a single course, the professors who taught a specific course offering can be found in the Course Professor Table. The Course Number used to connect these tables is another autogenerated number that has no significance outside of the SIS.

Lastly, it is important to note that the Departmental Program table connects to the Major table rather than the Department table. This is because some departments have multiple programs specific to each major within the department, while other departments have one honors program that multiple majors can enroll in.

Figure 14. Entity Relationship Diagram



2.9 System Architecture and Environment

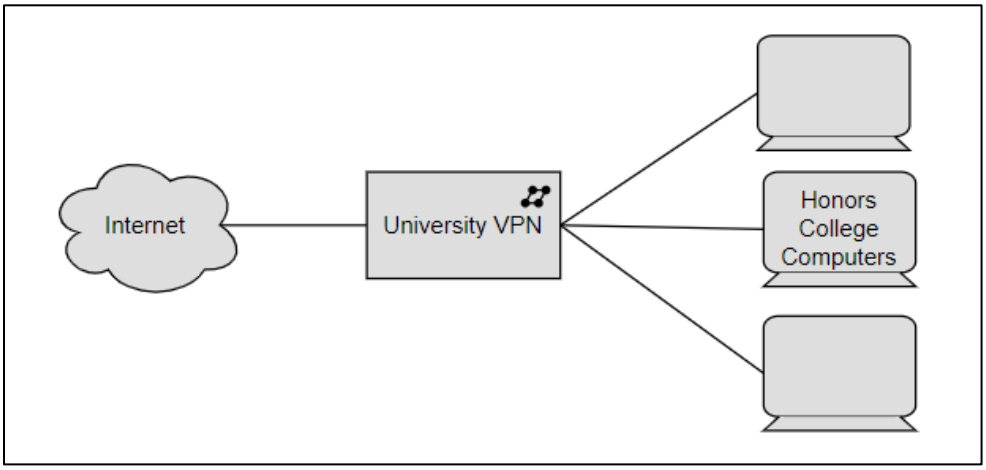
2.9.1 Architecture & User Collaboration

Since the student information system will only be housed in one physical office, the technology system architecture is relatively simple. The SIS will be stored on the University's V: drive, which is only accessible on University computers via VPN to authorized users. The Department of Undergraduate Education is responsible for granting this access and helps onboard and offboard student assistants. There are currently two designed computers for the honors student assistants and one designed for the Dean in the Honors College office.

The SIS is a local software-based application rather than a web-based application. Users can directly interact with the database through the Microsoft Access interface. Unlike other Microsoft file types that can be stored on OneDrive to provide user collaboration, Access files cannot be opened and edited in the OneDrive interface. Since user collaboration cannot be achieved on OneDrive, the SIS will be split into front-end and back-end systems to allow multiple users to interact with the front-end at once. The back-end of the system contains only the tables in the database, whereas the front-end includes the forms, queries, and reports the users directly interact with. Both the front- and back-ends will be stored on the V: drive.

This architectural design does not include any automated links to other systems, such as IAS. Rather, data is manually extracted and imported into the SIS. Although this simplifies the architecture, it does make the system vulnerable to any changes in the standard queries available in IAS. If they do change, then the Dean will need to collaborate with IAS to create custom queries.

Figure 15. SIS System Architecture



2.9.2 Security Measures

Given the sensitivity of the student academic information stored in the SIS, it is crucial to have sufficient security measures in place to ensure the Dean is preserving FERPA rules. To protect data from unauthorized access, the SIS should only be stored and backed up on the University's V: Drive. Although backups could be stored on OneDrive, this is strongly discouraged as files on OneDrive can easily be shared with personnel outside of the Honors College administration. Every student has a UAlbany email and OneDrive account, whereas only authorized users have access to the V: drive. To further restrict who has access to the SIS on the V: Drive, both the back-end and front-end of the SIS will be password protected.

Another level of security is required to ensure only the Dean and other future administrators have access to student GPAs and course grades. To restrict the student assistants from accessing this sensitive information, two different front-ends of the system will be created. The Dean and other administrators will have access to all the functionalities of the system through their version of the front-end. However, the student assistants' version will not include any forms or queries that extract student GPA or honors credit information from the tables in the back-end. Both front-ends will be password protected with different passwords. After the

database is implemented, it would be beneficial to have ITS review the system to ensure its security and compatibility with FERPA regulations.

2.9.3 Database Backups

It is recommended to back up the database on a weekly basis or before any data imports to avoid the loss of existing data. A macro to create a backup file is embedded on the homepage of the SIS's back-end. A copy of the backups should also be stored on an external hard drive. Over time, an administrator will need to manually go delete old backups to save file space; it is recommended to keep the three most recent backups in case any issues with the SIS are not immediately identified. To restore the database, an administrator will need to copy the preferred back-end backup file and paste it into the folder where the main database is housed. The file name will then need to be changed to match the original back-end file's name, so it is automatically linked with the front-ends.

2.10 Implementation & Expected Results

The student information system's implementation on Microsoft Access enabled the Honors College the obtain a customized, low-cost, and user-friendly system that can be used to help them achieve their daily administrative tasks and goals. Given that the Honors College administrative team is relatively small and does not include a data analyst, the creation of user-friendly interfaces is crucial to the system's long-term success. Since the Honors College team is not specially trained in analytics or database system software, giving the SIS a website-like feel with text descriptions and buttons on the forms should help the users feel comfortable with navigating and utilizing the system. Screenshots of the user interfaces in the database can be found in Appendix A.2.

By employing the student information system, the Honors College will be able to reduce time spent managing student records and ensure their records are accurate and up to date. Significant time will be saved in terms of updating majors, GPAs, and honors credits earned by using automated data imports rather than manually updating each student's record. The system will also provide more timely insight into student progress, as the academic performance queries will allow the Dean to view students not meeting one or more honors academic requirements within a matter of seconds. With this free time, the administration can dedicate more time directly engaging with students, potentially those at a higher risk of dropping out of the program. Predictors of honors retention and completion will be discussed in the next section.

III. Regression Analysis

3.1 Literature Review

Previous research on honors program completion rates has highlighted the variability in completion requirements across programs. Although the National Collegiate Honors Council has provided guidelines for a fully developed honors program, the criteria give significant autonomy to each program to decide what their requirements will be. There are no standard honors program completion criteria currently, nor are there standard admission criteria for entry into an honors program; the Council simply requires that retention and satisfactory completion criteria be clearly stated (National Collegiate Honors Council, 2017). For example, having the honors program curriculum comprise at least 20% of a student's degree program and requiring an undergraduate thesis are merely suggestions of the NCHC; these characteristics are not required for an honors program to form. As a result, there is significant variability between honors programs' graduation requirements.

Given this variability, one must be critical when comparing completion rates across honors programs. Hypothetically, the fewer requirements in a program, the easier it is for a student to complete the program (Goodstein & Szarek, 2013). However, past research has shown that there is no significant relationship between the rigor of a program’s requirements and the completion rate. For example, as reported by Public University Honors, CUNY Macaulay Honors College has an extremely high completion rate of 81.5% (2020). Macaulay's program is demanding, requiring students to complete a minimum of 24 honors course credits, complete their major-specific honors requirements, maintain at least a 3.3 GPA their first three semesters and at least a 3.5 thereafter, complete a senior thesis or capstone project, and complete 30 hours of community service by graduation (Macaulay Honors College, n.d.a). In contrast, the

University of North Florida's honors curriculum is significantly less work, only requiring 14 honors course credits, a cumulative 3.0 GPA, and the completion of a capstone project (McKay, 2009). Despite this lighter course load, UNF's completion rate is only 35% (McKay, 2009).

To further complicate things, UAlbany Honors College's curriculum is more similar in rigor to Macaulay's, requiring students to complete 18 honors course credits, complete additional requirements in their departmental honors programs, earn a 3.25 GPA first semester and a 3.5 each semester thereafter, and complete an honors project or thesis ("The Honors College," n.d.b). However, UAlbany's completion rate is only around 25%, which is more similar to UNF's completion rate. A possible explanation for this discrepancy is the applicant pool size. Macaulay's application pool includes all incoming freshmen in the CUNY system, while UAlbany's application pool is restricted to UAlbany applicants, rather than the entire SUNY system (Macaulay Honors College, n.d.b).

This inconsistency between program rigor and retention rates illuminates the difficulty when comparing honors programs solely based on completion rates. Additionally, it emphasizes that lightening program requirements is not necessarily the secret to achieving high completion rates. Previous research has primarily focused on identifying which student characteristics, rather than program characteristics, predict retention and completion. One of the first studies conducted on this subject was McKay's analysis of retention predictors for the University of North Florida's Honors Program. This study focused on demographic and pre-entry admissions variables, including SAT scores, HSGPA, gender, and ethnicity. McKay's (2009) study of UNF honors students from 2002-2005 suggests that HSGPA is the best predictor of honors college program completion, and the use of SAT scores in the admissions process should be eliminated. Campbell and Fua (2008) conducted a similar study, using both pre-entry and post-entry

variables to find the best predictors of success in earning an Honors Degree at a large, Mid-Western public university. The most important predictors identified were the pre-entry variables of HSGPA, high school class rank, and gender, as well as the post-entry variables of first-semester college GPA and whether a student initially lived in honors housing.

Expanding upon this research, Savage, Raehsler, and Fiedor conducted their own regression analysis of the Clarion University Honors program with student data from 2003-2013. Their analysis included similar variables used in McKay (2009) and Campbell and Fua's studies, such as HSGPA, verbal SAT score, mathematics SAT score, and gender. The effect of major was also examined, grouping students by their department of Arts & Sciences, Business, or Education. Similar to McKay's study, HSGPA was the strongest predictor of honors completion. When examining the effect of the department, business students had an 11.1% higher completion rate in Clarion's Honors Program than students with other majors (Savage et al., 2014).

While these insights may be useful for the individual universities where the research was conducted, these results should not be generalized given the significant variability in program features and requirements among honors programs. Although HSGPA is a likely predictor for many honors programs, given its prominent role in admissions decisions, the impacts of living in honors housing and major could greatly vary depending on the on-campus environment and the honors program's catering to specific majors, respectively. As Herron (2013) points out, "Each [honors program] is unique, with its own mission and goals relative to the mission and goals of the academic institution where it is housed." Therefore, rather than assume these predictors for other programs will hold true for UAlbany's Honors College, it would be more beneficial to conduct an analysis specific to UAlbany based on past students' successful and unsuccessful completion of the Honors College program.

3.2 Methodology

Using data provided by Institutional Research, a series of logistic regressions were conducted with the software JASP to identify predictors of honors program retention and completion over different time horizons for direct admit and first-semester admit honors students. A list of the null hypotheses being tested in each analysis is outlined in Table 13. Each model's binary dependent variable was either 1) whether the student was retained over the specified time period or 2) whether the student completed the honors program. Both pre-entry and post-entry independent variables were analyzed to help clarify whether Admissions should alter their program admissions criteria to better select students most likely to retain and complete the program. The results of the analysis will also indicate whether a student's academic plan and first-semester performance have an influence on their retention and program completion. If so, then it will be possible for the Honors College to identify and assist students at a higher risk of dropping out. The independent variables used in one or more of the regression analyses are provided in Table 14.

Table 13. Null Hypotheses

Number	Hypothesis
$H_0$1	There will be no significant prediction of 1-Year Retention by Superscore, HSGPA, Term 1 GPA, Gender, Admit Type, and Honors Program for Term 1 Major.
$H_0$2	There will be no significant prediction of 1-Year to 2-Year Retention by Superscore, HSGPA, Term 1 GPA, Gender, Admit Type, Honors Program for Term 3 Major, and Major Change from Term 1 to Term 3.
$H_0$3	There will be no significant prediction of 2-Year to 3-Year Retention by Superscore, HSGPA, Term 1 GPA, Gender, Admit Type, Honors Program for Term 5 Major, and Major Change from Term 3 to Term 5.
$H_0$4	There will be no significant prediction of 3-Year to 4-Year Completion by Superscore, HSGPA, Term 1 GPA, Admit Type, Honors Program for Term 7 Major, and Major Change from Term 5 to Term 7.
$H_0$5	There will be no significant prediction of 4-Year Completion by Superscore, HSGPA, Term 1 GPA, Gender, Admit Type, and Honors Program for Term 1 Major.

The data set provided includes all honors students admitted to the University between Fall 2013 – Fall 2019. Three students who were not enrolled at the University consecutive semesters were removed from the dataset. The first step in preparing the data for analysis was to determine whether students were direct admits, first-semester admits, or second-semester admits by comparing their term admitted to the University and term admitted to the Honors College. The categorical variable Admittance Term indicates when a student was admitted to the Honors College. Given the low sample size of the second-semester admits (n = 19), these students were excluded from the analysis. Admittance Type is hypothesized to be a predictor of retention and completion, as students admitted after their first semester are not as well integrated into the honors community. These students did not have the opportunity to live in honors housing their first semester and take fewer honors courses than direct admits.

Next, HSGPA was converted to a 4.0 scale to be comparable with Term 1 GPA's 4.0 scale. Based on the prior research conducted by McKay (2009), Campbell and Fua (2008), and Savage et al. (2014), HSGPA and Term 1 GPA will likely be predictors of retention and completion. It is important to note that direct admissions decisions are made with HSGPA, while first-semester admission decisions are only made with Term 1 GPA. SAT/ACT Superscore is also used to make direct admission decisions. Given the recent controversy surrounding the use of standardized test scores, it is uncertain whether this variable will be a significant predictor in any of the regressions. Proponents of standardized testing have argued that the SAT and ACT provide a means for admissions to fairly compare students, given the variance in coursework rigor and grade inflation across high schools (Buckley, Letukas, & Wildavsky, 2018). However, recent research has revealed correlations between test scores and socioeconomic status, as well as performance differences across racial and ethnic groups (as cited in Buckley et al., 2018).

Depending on the results of the regression analysis, the Honors College may want to consider implementing a test-optional policy.

The effects of changing majors and having a departmental honors program are captured with dummy variables. In the data set, each student's major during Term 1, Term 3, Term 5, and Term 7 were provided, given the student was still enrolled at the University. From this information, whether a student's major changed term-to-term and whether that major has a departmental honors program was determined. The Change Major and Honors Program Boolean variables captures these attributes of each student's academic plan.

Hypothetically, students in a major with a departmental honors program may have an easier time completing the honors program, given the structure and guidance available within a program. However, it is also possible that students with a departmental honors program may drop out even earlier than those without an honors program, realizing they cannot handle the rigor of their program. Additionally, major changes could be another potential roadblock to honors program completion. The later a student changes their major, the more difficulty they may have completing their required honors coursework if they need to take extra credits from switching majors.

The final variable being analyzed is gender. Historically, there have been more females than males admitted to the Honors College. Therefore, it is possible there may be a correlation between gender and retention/completion. Such a correlation would indicate whether having a more balanced male: female ratio would be worthwhile in improving retention and completion rates.

Table 14. Independent Variable Descriptions

Independent Variable	Description	Type
HSGPA	High school grade point average; converted to a 4.0 scale	Pre-entry
SAT/ACT Superscore	The maximum of the: ACT Composite Score converted to the SAT scoring system OR the SAT Combined score	Pre-entry
Gender	The student's gender; M = Male, F = Female	Pre-entry
Term 1 GPA	The student's GPA at the end of their first semester	Post-entry
Admission Type	When the student was admitted to the Honors College; Direct = Directly admitted, FirstSem = After the first semester, SecondSem = After the second semester	Post-entry
Major Change from Term 1 to Term 3	Whether the student changed their major between Term 1 and Term 3	Post-entry
Major Change from Term 3 to Term 5	Whether the student changed their major between Term 3 and Term 5	Post-entry
Major Change from Term 5 to Term 7	Whether the student changed their major between Term 5 and Term 7	Post-entry
Honors Program for Term 1 Major	Whether a student's Term 1 Major has an honors program	Post-entry
Honors Program for Term 3 Major	Whether a student's Term 3 Major has an honors program	Post-entry
Honors Program for Term 5 Major	Whether a student's Term 5 Major has an honors program	Post-entry
Honors Program for Term 7 Major	Whether a student's Term 7 Major has an honors program	Post-entry

3.3 Regression Results

3.3.1 1-Year Retention

The 1-Year Retention regression analysis includes all 1002 students admitted to the University between Fall 2013 – Fall 2019 that were either directly admitted to the Honors College or after their first semester on campus. The independent variables analyzed include SAT/ACT Superscore, HSGPA, Term 1 GPA, Gender, Admittance type, and Honors Program for Term 1 Major. The dependent variable is whether a student was retained for one year (Yes) or not (No).

Table 15. 1-Year Retention Frequencies

Group	Sample Size
Males	398
Females	604
Direct Admit	865
First Semester Admit	137
Honors Program for Term 1 Major	648
No Honors Program for Term 1 Major	354

Table 16. 1-Year Retention Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
SAT/ACT Superscore	1328.022	88.264	1010	1590
HSGPA	3.810	0.135	3.200	4.000
Term 1 GPA	3.709	0.395	0.000	4.000

First, a logistic regression using the Enter method was run, so all variables are included in a single block. Logistic regressions are used for all the analyses, as the dependent variable of retention/completion is a categorical variable. The results of this regression are in Table 17. Next, a backwards regression was run to identify which variables are significant predictors of 1-Year Retention. The results indicated that HSGPA, Term 1 GPA, and Honors Program for Term 1 Major were predictors. However, once these three variables alone were rerun, Honors Program for Term 1 Major was shown to not be a predictor with a *p*-value of 0.111. As a result, this variable is removed from the final regression shown in Table 18.

Table 17. 1-Year Retention Logistic Regression

Variable	Coefficient	Odds Ratio	Wald Stat	*p*-Value
Superscore	0.001	1.001	0.544	0.461
HSGPA	1.643	5.168	4.646	0.031
Term 1 GPA	2.536	12.63	87.363	< .001
Gender (M)	0.104	1.11	0.254	0.614
Admit Type (FirstSem)	-0.142	0.868	0.161	0.688
Honors Program for Term 1 Major (No)	0.316	1.372	2.305	0.129

Year 1 Retention level "Yes" coded as class 1

Table 18. 1-Year Retention Significant Logistic Regression

Variable	Coefficient	Odds Ratio	Wald Stat	*p*-Value
HSGPA	1.831	6.241	6.841	0.009
Term 1 GPA	2.451	11.605	96.538	< .001

Year 1 Retention level "Yes" coded as class 1

The results in Table 18 confirm that Term 1 GPA and HSGPA are the only significant predictors of one-year retention in the Honors College, as all their *p*-values are less than 0.1. However, Term 1 GPA is a much stronger predictor than HSGPA, given its significantly higher Wald Statistic value. Additionally, it is noteworthy that Superscore is not a predictor of one year retention, even though it is currently used in Honors College direct admissions decisions. Rather, HSGPA is the best predictor of one year retention out of the pre-entry variables, affirming its value in direct admissions decisions.

Based on the final regression analysis results in Table 18, the following model can be used to determine the odds of a direct or first-semester admit's one year retention in the Honors College:

$$ln(\text{odds of 1-Year Retention}) = -14.85 + 1.831(\text{HSGPA}) + 2.451\ (\text{Term 1 GPA})$$

Holding all else constant, for every 0.1 point increase in HSGPA, the odds of the student being retained one year increases by 0.6241. Additionally, for every 0.1 increase in Term 1 GPA, the odds of the student being retained one year increases by 1.1605, holding all else constant.

3.3.2 1-Year to 2-Year Retention

The 1-Year to 2-Year Retention regression analysis's population is 732. This includes all students admitted to the University between Fall 2013 – Fall 2018 who were either direct or first semester admits to the Honors College and already retained through Term 3. The independent variables analyzed include SAT/ACT Superscore, HSGPA, Term 1 GPA, Gender, Admittance Type, Honors Program Term 3 Major, and Major Change from Term 1 to Term 3. The dependent variable is whether a student was retained two years (Yes) or not (No).

Table 19. 1-Year to 2-Year Retention Frequencies

Group	Sample Size
Males	291
Females	441
Direct Admit	626
First Semester Admit	106
Honors Program for Term 3 Major	483
No Honors Program for Term 3 Major	249
Changed Major from Term 1 to Term 3	192
Didn't Change Major from Term 1 to Term 3	540

Table 20. 1-Year to 2-Year Retention Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
SAT/ACT Superscore	1327.445	90.073	1030	1590
HSGPA	3.817	0.134	3.200	4.000
Term 1 GPA	3.774	0.279	0.000	4.000

First, a logistic regression using the Enter method was run, so all variables are included in a single block. The results of this regression are in Table 21. Next, a backwards regression was run to identify which variables are significant predictors of 1-Year to 2-Year Retention. The backwards regression indicated that Term 1 GPA, Admit Type, and Major Change from Term 1 to Term 3 were predictors. However, when these three variables were isolated in a second regression, both Admit Type and Major Change from Term 1 to Term 3 had *p*-values greater than 0.1 and were therefore removed from the final model in Table 22.

Table 21. 1-Year to 2-Year Retention Logistic Regression

Variable	Coefficient	Odds Ratio	Wald Stat	*p*-Value
Superscore	-0.001	0.999	0.438	0.508
HSGPA	0.461	1.586	0.371	0.542
Term 1 GPA	1.774	5.894	23.784	< .001
Gender (M)	0.132	1.142	0.454	0.501
Admit Type (FirstSem)	-0.418	0.659	1.668	0.196
Honors Program for Term 3 Major (No)	-0.145	0.865	0.534	0.465
Major Change from Term 1 to Term 3 (Yes)	0.324	1.383	2.183	0.14

Year 2 Retention level "Yes" coded as class 1

Table 22. 1-Year to 2-Year Retention Significant Logistic Regression

Variable	Coefficient	Odds Ratio	Wald Stat	*p*-Value
Term 1 GPA	1.594	4.925	21.726	< 0.001

Year 2 Retention level "Yes" coded as class 1

Term 1 GPA is the only significant predictor of 1-Year to 2-Year Retention, as confirmed by the *p*-value result in Table 22. Interestingly, none of the pre-entry variables are predictors. Although HSGPA may not be valuable beyond a student's first year to predict retention, the significance of Term 1 GPA creates a window of opportunity for the Honors College to increase retention by assisting students who may be struggling academically after their first semester.

Based on the final regression analysis results in Table 22, the following model can be used to determine the odds of a direct or first-semester admit's 1-Year to 2-Year Retention in the Honors College:

$$ln(\text{odds of 1-Year to 2-Year Retention}) = -4.672 + 1.594(\text{Term 1 GPA})$$

Holding all else constant, for every 0.1 point increase in Term 1 GPA, the odds of the student being retained another year increases by 0.4925.

3.3.3 2-Year to 3-Year Retention

The 466 students in the population for 2-Year to 3-Year Retention were admitted to the University between Fall 2013 – Fall 2017. All students included were either admitted directly into the Honors College or after their first semester and retained through Term 5. The independent variables analyzed include SAT/ACT Superscore, HSGPA, Term 1 GPA, Gender, Admittance Type, Honors Program for Term 5 Major, and Major Change from Term 3 to Term 5. The dependent variable is whether a student was retained three years (Yes) or not (No).

Table 23. 2-Year to 3-Year Retention Frequencies

Group	Sample Size
Males	188
Females	278
Direct Admit	404
First Semester Admit	62
Honors Program for Term 5 Major	283
No Honors Program for Term 5 Major	183
Changed Major from Term 3 to Term 5	76
Didn't Change Major from Term 3 to Term 5	390

Table 24. 2-Year to 3-Year Retention Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
SAT/ACT Superscore	1326.953	89.198	1030	1590
HSGPA	3.823	0.129	3.200	4.000
Term 1 GPA	3.796	0.225	2.600	4.000

First, a logistic regression using the Enter method was run, so all variables are included in a single block. The results of this regression are in Table 25. Next, a backwards regression was run to identify which variables are significant predictors of 2-Year to 3-Year Retention. The results indicated that only Major Change from Term 3 to Term 5 was a predictor. Although this variable was still significant when it was isolated in the final regression, it should be noted that this model does not have a strong goodness of fit; the McFadden R^2 value is an extremely low value of 0.006. Therefore, there is no recommended model available for the administration to use to try to predict retention rates from year 2 to year 3.

Table 25. 2-Year to 3-Year Logistic Regression

Variable	Coefficient	Odds Ratio	Wald Stat	*p*-Value
Superscore	0.001	1.001	0.199	0.656
HSGPA	1.016	2.761	1.461	0.227
Term 1 GPA	-0.023	0.977	0.002	0.96
Gender (M)	-0.027	0.973	0.017	0.897
Admit Type (FirstSem)	0.282	1.325	0.602	0.438
Honors Program for Term 5 Major (No)	0.09	1.094	0.189	0.663
Major Change from Term 3 to Term 5 (Yes)	0.588	1.8	3.863	0.049

Year 3 Retention level "Yes" coded as class 1

Table 26. 2 Year to 3 Year Significant Logistic Regression

Variable	Coefficient	Odds Ratio	Wald Stat	*p*-Value
Major Change from Term 3 to Term 5 (Yes)	0.523	1.687	3.247	0.072

Year 2 Retention level "Yes" coded as class 1

3.3.4 3-Year Retention to 4-Year Completion

The 3-Year Retention to 4-Year Completion regression analysis's population is 251. This includes all students admitted to the University between Fall 2013 – Fall 2016 who were either direct or first semester admits to the Honors College that were already retained through Term 7. Only students who completed their honors thesis within four years of their admit term were flagged as "Yes" for graduating from the Honors College. The independent variables analyzed include SAT/ACT Superscore, HSGPA, Term 1 GPA, Gender, Admittance Type, Honors Program for Term 7 Major, and Major Change from Term 5 to Term 7. The dependent variable is whether a student graduated from the Honors College within four years (Yes) or not (No).

Table 27. 3-Year to 4-Year Completion Frequencies

Group	Sample Size
Males	101
Females	150
Direct Admit	222
First Semester Admit	29
Honors Program for Term 7 Major	156
No Honors Program for Term 7 Major	95
Changed Major from Term 5 to Term 7	22
Didn't Change Major from Term 5 to Term 7	229

Table 28. 3-Year to 4-Year Completion Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
SAT/ACT Superscore	1335.179	89.797	1040	1590
HSGPA	3.831	0.126	3.400	4.000
Term 1 GPA	3.795	0.240	2.740	4.000

First, a logistic regression using the Enter method was run, so all variables are included in a single block. The results of this regression are in Table 29. Next, a backwards regression was run to identify which variables are significant predictors of 3-Year Retention to 4-Year Completion. Then, a final regression using the Enter method was run only using the variables identified as significant in the backwards regression: Gender and Honors Program for Term 7 Major. The results of the final regression are shown in Table 30.

Table 29. 3-Year to 4-Year Completion Regression Analysis

Variable	**Coefficient**	**Odds Ratio**	**Wald Stat**	***p*-Value**
Superscore	0	1	0.021	0.885
HSGPA	1.636	5.135	2.036	0.154
Term 1 GPA	0.511	1.667	0.776	0.378
Gender (M)	-0.466	0.628	2.706	0.1
Admit Type (FirstSem)	0.415	1.515	0.673	0.412
Honors Program for Term 7 Major (Yes)	0.454	1.574	2.658	0.103
Major Change from Term 5 to Term 7 (Yes)	-0.362	0.697	0.566	0.452

4-Year Completion level "Yes" coded as class 1

Table 30. 3-Year to 4-Year Completion Significant Regression Analysis

Variable	**Coefficient**	**Odds Ratio**	**Wald Stat**	***p*-Value**
Gender (M)	-0.503	0.605	3.575	0.059
Honors Program for Term 7 Major (Yes)	0.463	1.589	2.960	0.085

4-Year Completion level "Yes" coded as class 1

The results of the final model confirm that Gender and Honors Program for Term 7 Major are the only significant predictors of 3-Year Retention to 4-Year Completion, given that their *p*-values are less than 0.1. This is the first significant model to not include Term 1 GPA as a predictor, which could be a result of this model having the smallest Term 1 GPA range. It is also noteworthy that this is the first time gender and having an honors program have been significant variables.

Based on the final regression analysis results in Table 30, the following model can be used to determine the odds of a direct or first-semester admit's 3-Year Retention to 4-Year Completion in the Honors College:

$$ln(\text{odds of 3-Year Retention to 4-Year Completion}) = -0.309 - 0.503(\text{Gender}) + 0.463(\text{Honors Program for Term 7 Major})$$

Holding all else constant, males are 1.653 times more likely to not finish the honors program within one year than females. Additionally, students who have a departmental honors program senior year are 1.589 times more likely to finish the honors program than students who do not have a departmental honors program, holding all else constant.

3.3.5 4-Year Completion

The 4-Year Completion regression analysis includes all 556 students admitted to the University between Fall 2013 – Fall 2016 that were either directly admitted to the Honors College or admitted after their first semester on campus. Similar to the 1-Year Retention regression analysis, this analysis only includes pre-entry variables and post-entry variables from freshman year. As a result, this model should only be used to make completion predictions for students who have just completed their freshman year. The dependent variable is whether students completed the honors program within four years (Yes) or not (No).

Table 31. 4-Year Completion Frequencies

Group	Sample Size
Males	237
Females	319
Direct Admit	492
First Semester Admit	64
Honors Program for Term 1 Major	361
No Honors Program for Term 1 Major	195

Table 32. 4-Year Completion Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
SAT/ACT Superscore	1332.158	87.244	1040	1590
HSGPA	3.814	0.131	3.200	4.000
Term 1 GPA	3.695	0.398	0.000	4.000

First, a logistic regression using the Enter method was run, so all variables are included in a single block. The results of this regression are in Table 33. Next, a backwards regression was run to identify which variables are significant predictors of 4-Year Completion. Then, a final regression using the Enter method was run only using the variables identified as significant in the backwards regression: HSGPA, Term 1 GPA, and Gender,

Table 33. 4-Year Completion Regression Analysis

Variable	Coefficient	Odds Ratio	Wald Stat	*p*-Value
Superscore	0	1	0.086	0.769
HSGPA	1.728	5.627	3.822	0.051
Term 1 GPA	1.932	6.905	17.763	< .001
Gender (M)	-0.551	0.576	6.311	0.012
Admit Type (FirstSem)	-0.216	0.806	0.309	0.578
Honors Program for Term 1 Major (Yes)	0.079	1.082	0.135	0.713

4-Year Completion level "Yes" coded as class 1

Table 34. 4-Year Completion Significant Regression Analysis

Variable	Coefficient	Odds Ratio	Wald Stat	*p*-Value
HSGPA	1.873	6.506	5.298	0.021
Term 1 GPA	1.857	6.404	17.904	< .001
Gender (M)	-0.57	0.566	7.074	0.008

4-Year Completion level "Yes" coded as class 1

When only looking at a student's high school and freshman year performance, the significant predictors of 4-Year Completion are HSGPA, Term 1 GPA, and Gender. However, similarly to the 1-Year Retention analysis, Term 1 GPA is a much stronger predictor than HSGPA and Gender, given its significantly higher Wald Statistic value. Additionally, Superscore is still insignificant, making HSGPA the better academic pre-entry predictor.

Based on the final regression analysis results in Table 34, the following model can be used to determine the odds of a direct or first-semester admit graduating from the Honors College within four years of their University admit term:

$$ln(\text{odds of 4-Year Completion}) = -14.996 + 1.873(\text{HSGPA}) + 1.857(\text{Term 1 GPA}) - 0.570(\text{Gender})$$

Holding all else constant, for every 0.1 point increase in HSGPA, the odds of the student achieving four year completion increases by 0.6506. Additionally, for every 0.1 increase in term 1 GPA, the odds of the student achieving four-year completion increases by 0.6404, holding all else constant. Lastly, males are 1.767 times more likely than females to not achieve four-year completion, holding all else constant.

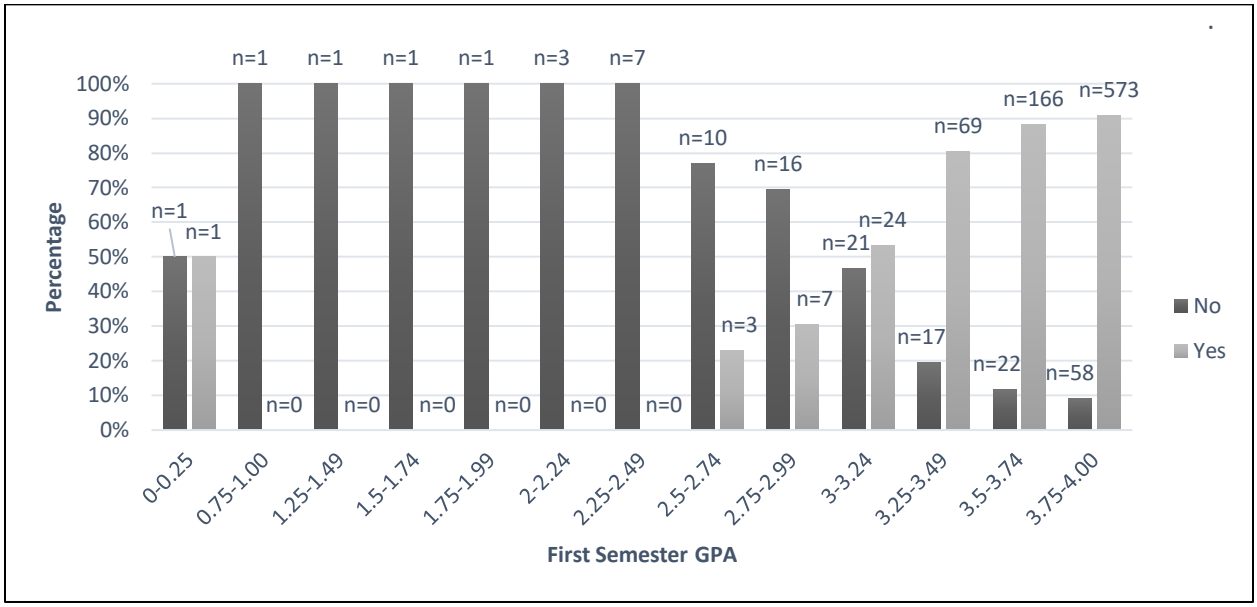
3.4 Implications

3.4.1 Term 1 GPA

Term 1 GPA is the strongest predictor of 1-Year Retention, 1-Year to 2-Year Retention, and 4-Year Completion. The majority of students who earn a 3.25 GPA or higher first semester are retained at least one year, with a peak retention of 91% in the 3.75-4.0 GPA bracket. However, the retention reaches a nearly 50%-50% split in the 3-3.24 GPA bracket. This tipping point is where the Honors College may be able to take the most action to improve retention rates solely based on GPA. If the group of students who are on the edge of meeting the minimum cumulative GPA requirement to remain in the Honors College are given extra support in their freshman spring semester, they may be able to increase their GPA over the 3.30 threshold. Additional support could be provided in the form of reminding students of the tutoring resources on campus and connecting them with upperclassmen honors peer mentors.

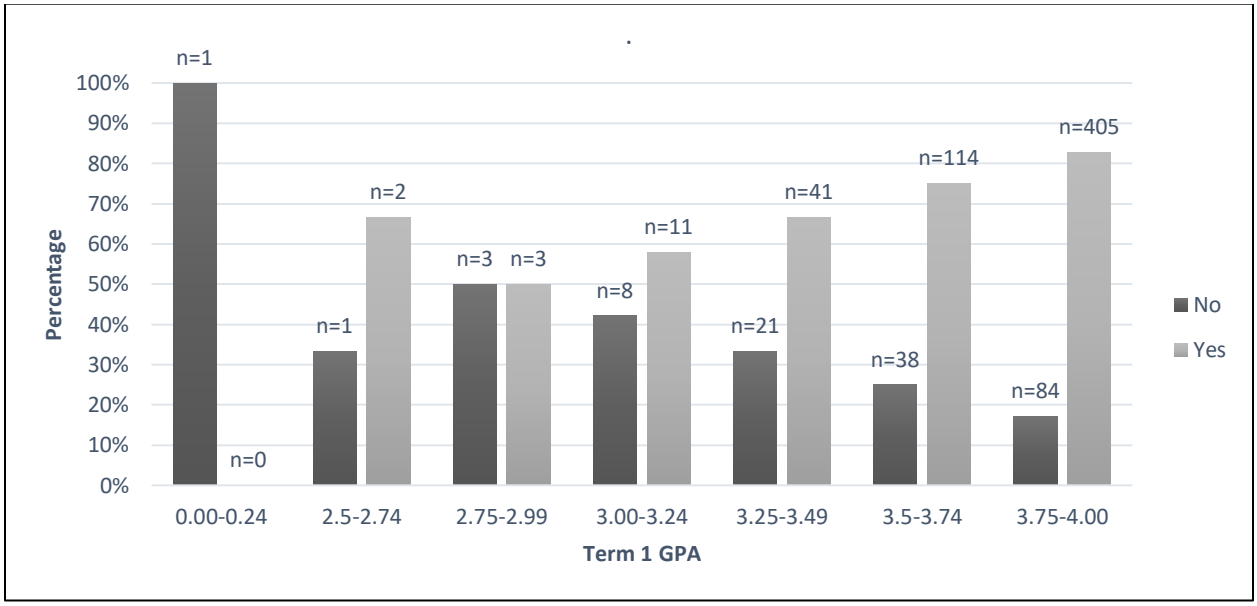
Out of those students retained one year, the percentage of students within each GPA bracket that are retained a second year is fairly similar in shape; over 80% of students who earn a 3.75-4.0 GPA are retained, and the 50-50 retention tipping point decreases one bracket to the 2.75-2.99 range.

Figure 16. 1-Year Retention Rates by Term 1 GPA



Population: Direct admits and first semester admits admitted to the University between Fall 2013 – Fall 2019

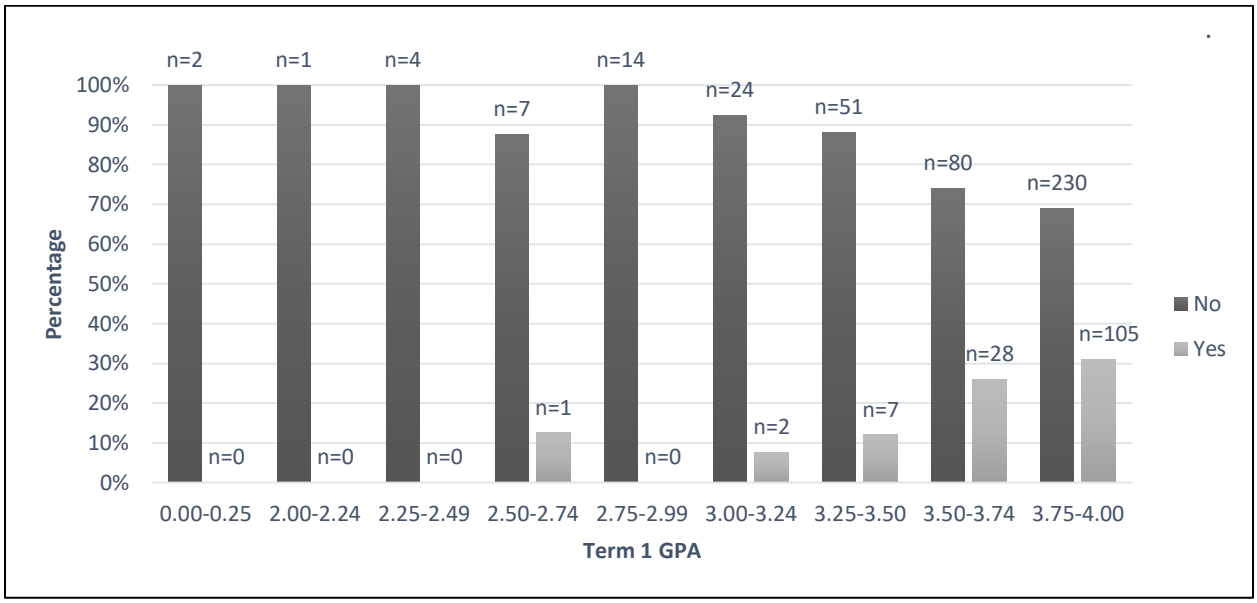
Figure 17. 1-Year to 2-Year Retention Rates by Term 1 GPA



Population: Direct admits and first semester admits admitted to the University between Fall 2013 – Fall 2018, who were previously retained one year in the Honors College

Despite the initial promising outlook for those students earning at least a 3.25 GPA in Term 1, only 12% of students earning a 3.25-3.50 GPA and 30% of students earning a 3.50 GPA or higher finish the honors program. Although increasing resources pushed to students earning a 3.0-3.24 GPA in Term 1 may have the most promising return potential on improving 1-Year and 1-Year to 2-Year Retention, the students earning a 3.50-4.0 ultimately have the highest 4-year completion rates. Therefore, they should not be overlooked despite their initially strong academic performance, as these students may be a better long-term investment in terms of boosting completion rates.

Figure 18. 4-Year Completion Rates by Term 1 GPA



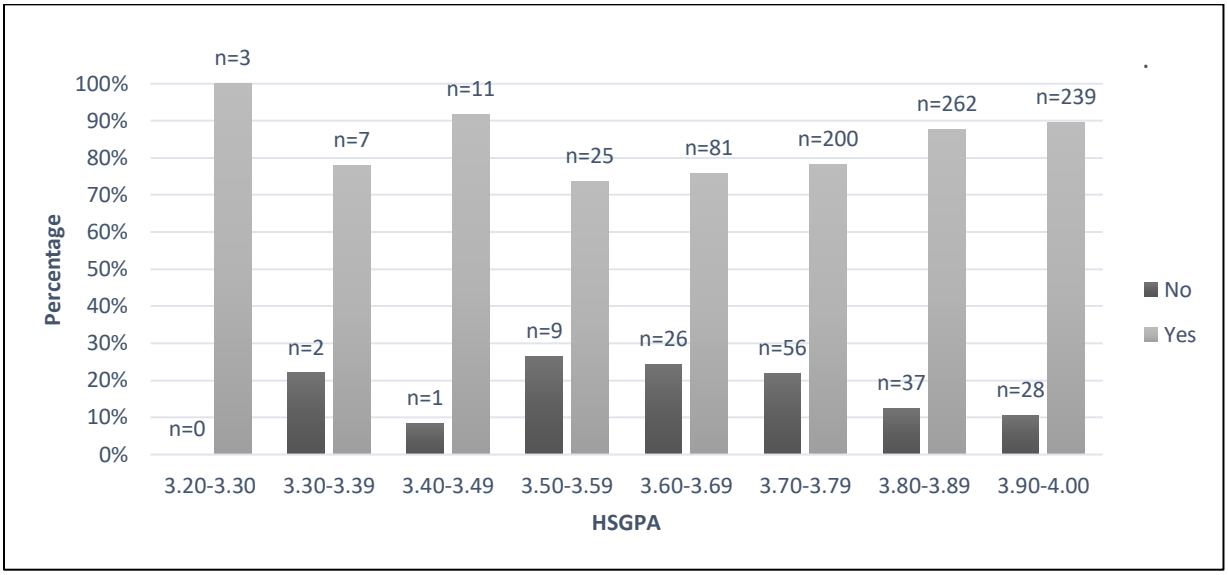
Population: Direct admits and first semester admits admitted to the University between Fall 2013 – Fall 2016, who graduated from the Honors College within four years of their admissions to the University

3.4.2 HSGPA

Although it is not as strong of a predictor as Term 1 GPA, HSGPA is the most significant pre-entry predictor for 1-Year Retention and 4-Year Completion. Currently, the Honors College typically accepts students who earn a 90 (3.6 on a 4-point scale) average or higher in the core subjects of math, English, science, history, and foreign language (University at Albany, SUNY,

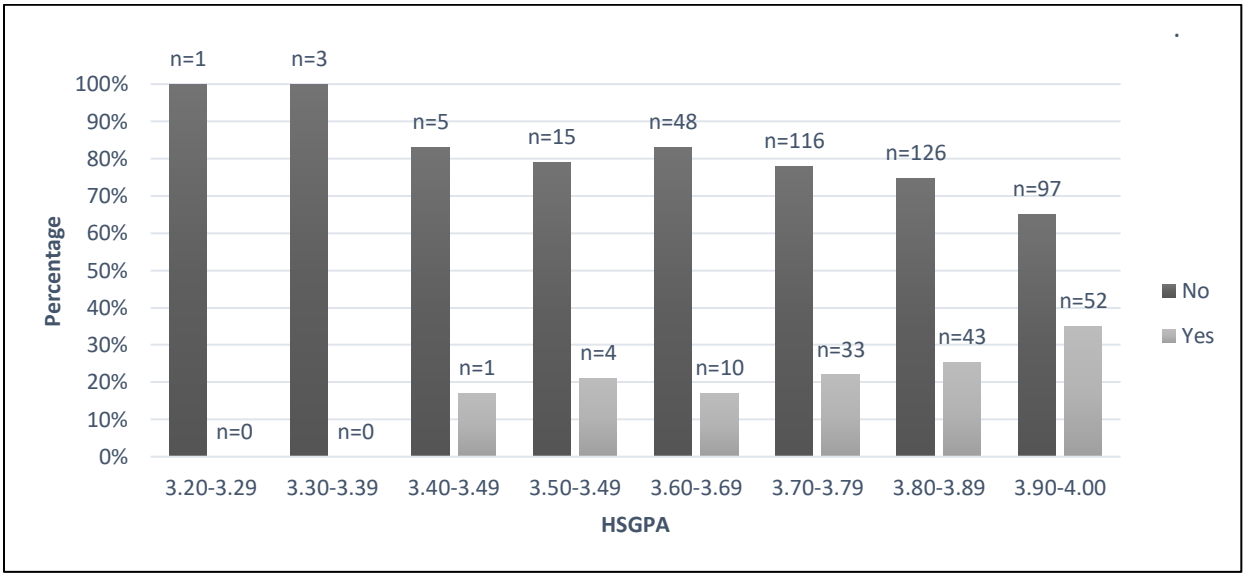
n.d.a). As a result, there is a significant drop in the sample size below the 3.60-3.69 bracket. Excluding those who earned below a 3.60 HSGPA due to the low sample sizes, the higher the HSGPA bracket, the higher the percentage of students retained one year and the higher the percentage of students who graduated from the Honors College in four years.

Figure 19. 1-Year Retention Rates by HSGPA



Population: Direct admits and first semester admits admitted to the University between Fall 2013 – Fall 2019 who submitted HSGPAs

Figure 20. 4-Year Completion Rates by HSGPA



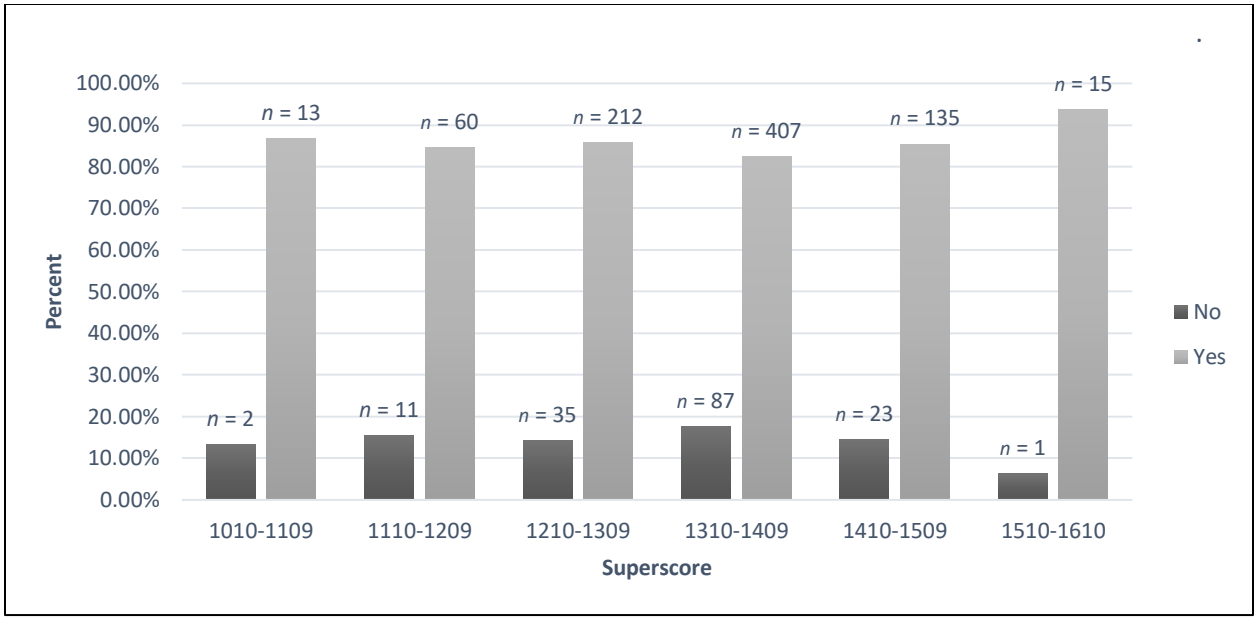
Population: Direct admits and first semester admits admitted to the University between Fall 2013 – Fall 2016, who graduated from the Honors College within four years of their admissions to the University and reported a HSGPA

Given that there is no sharp decline in one year retention rates between any of the HSGPA brackets above 3.6, the HSGPA admissions criterion does not necessarily need to be altered. Rather, the administration should be aware that students on the lower end of the HSGPA range are more likely to drop out than those in the 3.8-4.0 range. Therefore, it may be beneficial to review the academic performance of those students with a 3.5-3.8 HSGPA after their first semester to see whether additional academic support should be provided.

3.4.3 SAT/ACT Superscore

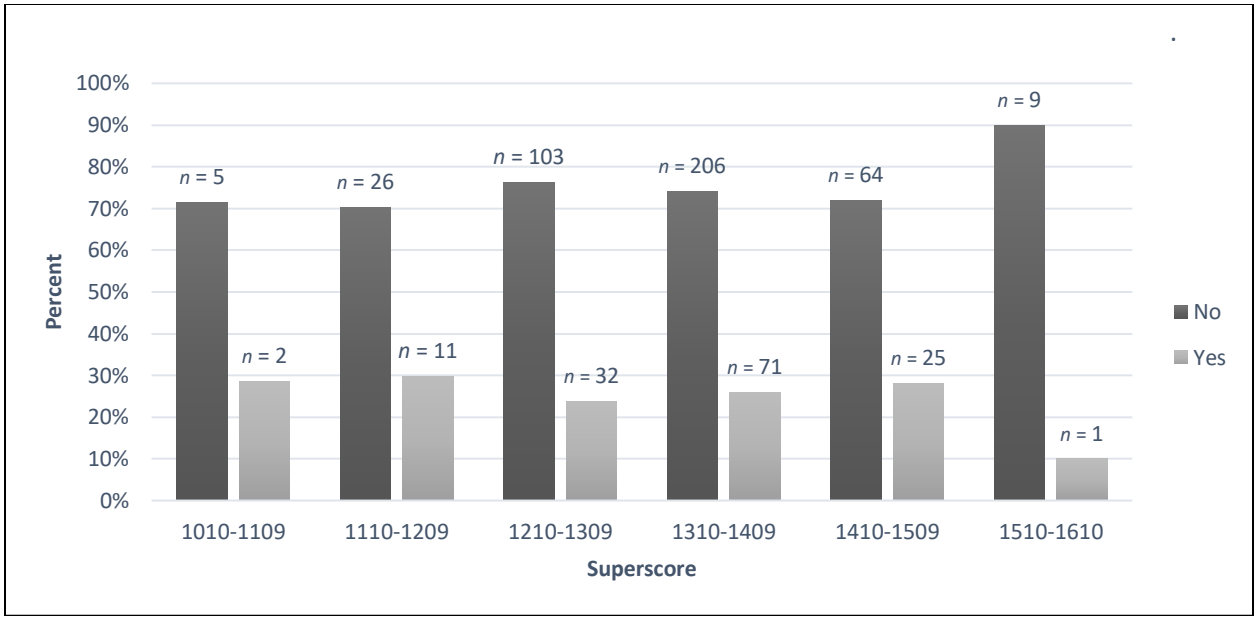
Despite the reliance on SAT/ACT Superscore to make Honors College admissions decisions, the regression analysis results indicate that Superscore is not a predictor of retention or completion. Superscore consistently had one of the lowest Wald Statistic values across the five regressions, indicating that it is one of the worst predictors. Given this knowledge, the Admissions Office and Honors College should reconsider how strongly SAT/ACT Superscore weighs on their admissions decisions. Historically, students earning at least a 1310 SAT/ACT Superscore are admitted to the Honors College (University at Albany, SUNY, n.d.a). However, given that the retention and completion percentages are fairly equal across the range of Superscore brackets, 1310 does not necessarily need to be the cutoff point. Out of the 333 students admitted with less than a 1310 Superscore, 85.6% retained one year, which is slightly better than the 83.4% retained of the 668 students admitted with a Superscore of 1310 or higher.

Figure 21. 1-Year Retention Rates by SAT/ACT Superscore



Population: Direct admits and first semester admits admitted to the University between Fall 2013 – Fall 2019 that reported a SAT or ACT score

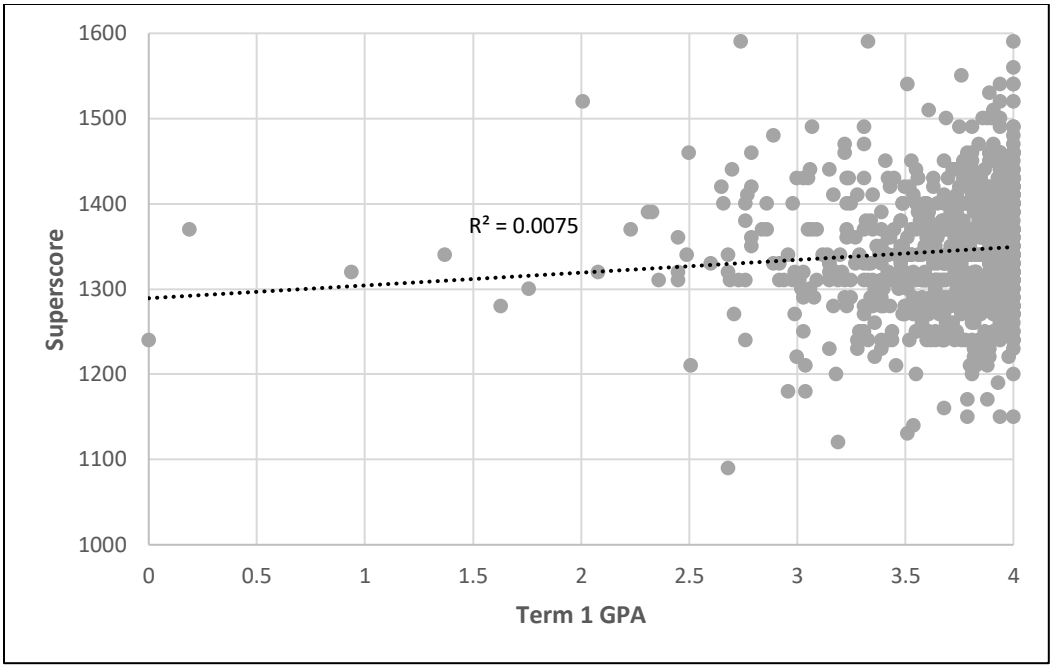
Figure 22. 4-Year Completion Rates by SAT/ACT Superscore



Population: Direct admits and first semester admits admitted to the University between Fall 2013 – Fall 2016, who graduated from the Honors College within four years of their admissions to the University and reported a SAT or ACT score

These results indicate those prospective students with low superscores, but otherwise academically strong applications, are just as likely to be successful in the Honors College and should be considered for admittance. Although prior research has indicated that SAT scores can be useful in predicting college grades, this does not mean that SAT scores will be useful to the Honors College in predicting student retention and completion, despite their significant relationship with Term 1 GPA. Given the variability in course content and rigor, Sackett and Kuncel (2018) argue that a correlation of at least 0.35 between standardized test scores and college GPA indicates usefulness in SAT scores for making admissions decisions. While being able to predict students' performance would be useful to the Honors College, as students must maintain a certain GPA, there is no significant relationship between past direct admit honors students' Superscore and Term 1 GPA. Figure 23 illustrates the weak relationship between Term 1 GPA and Superscore, which has an R^2 value of 0.0075. This may be due to honors students typically landing in the higher SAT percentiles, whereas University-wide admissions encounter a much larger range of SAT percentiles. Therefore, while SAT/ACT Superscore may be useful for initial University admission decisions, it does not appear to be valuable in Honors College admissions decisions in terms of predicting honors students' academic performance.

Figure 23. Term 1 GPA vs. Superscore

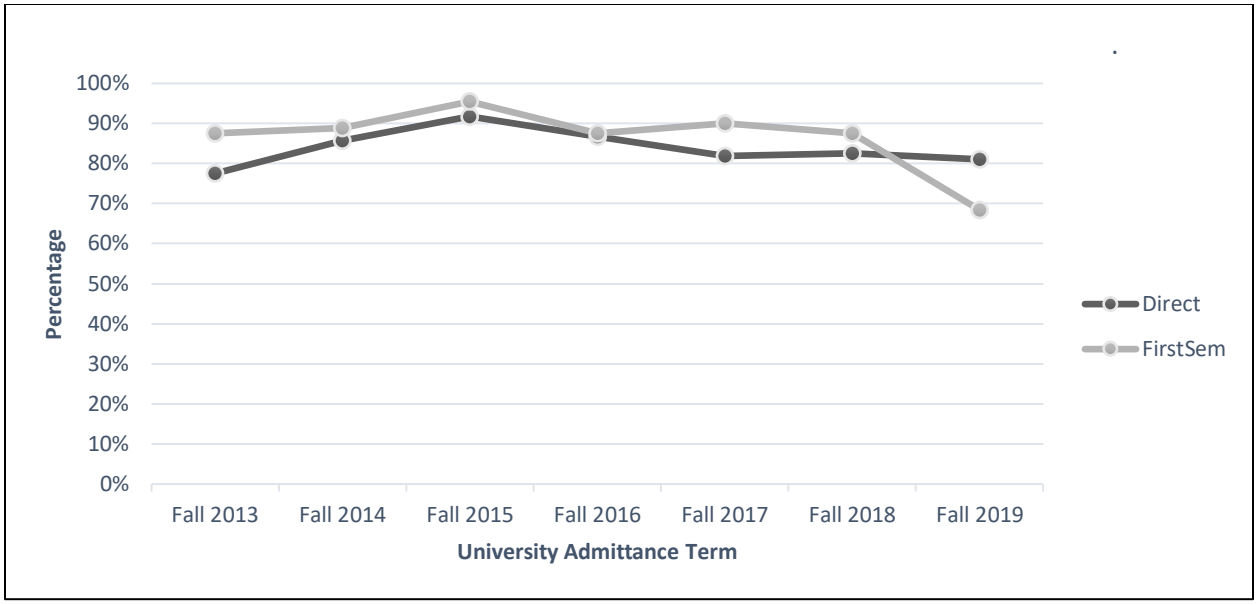


Population: Direct admits admitted to the University between Fall 2013 – Fall 2019 who reported a SAT or ACT score

3.4.4 Admission Type

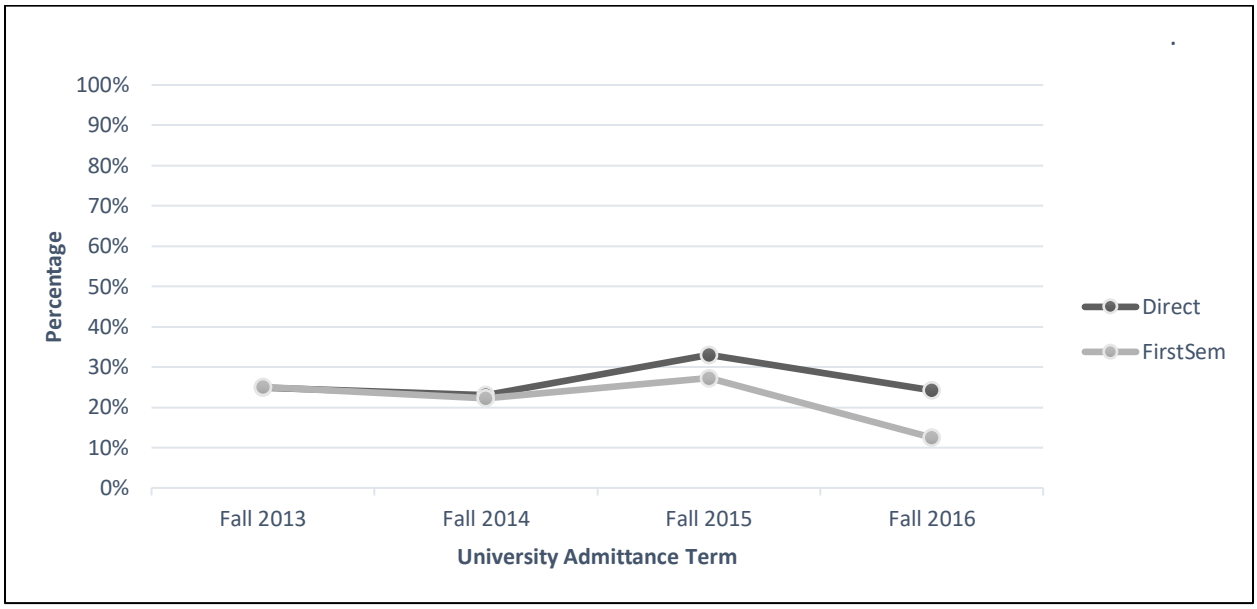
Admission type was not a significant predictor of retention or completion in any of the regression models. The retention and completion rates of direct admits and first semester admits have been fairly similar and remained relatively constant over time, as illustrated in Figure 24 and Figure 25. Such similarities indicate that first-year admits are not negatively impacted from missing out on opportunities direct admits had during their first semester, such as living in honors housing, participating in the Honors College summer orientation, and taking more honors courses. Therefore, admitting students after their first semester on campus has proven to be a worthwhile investment for the Honors College.

Figure 24. 1-Year Retention Rates by Admit Type



Population: Direct admits and first semester admits admitted to the University between Fall 2013 – Fall 2019

Figure 25. 4-Year Retention Rates by Admit Type



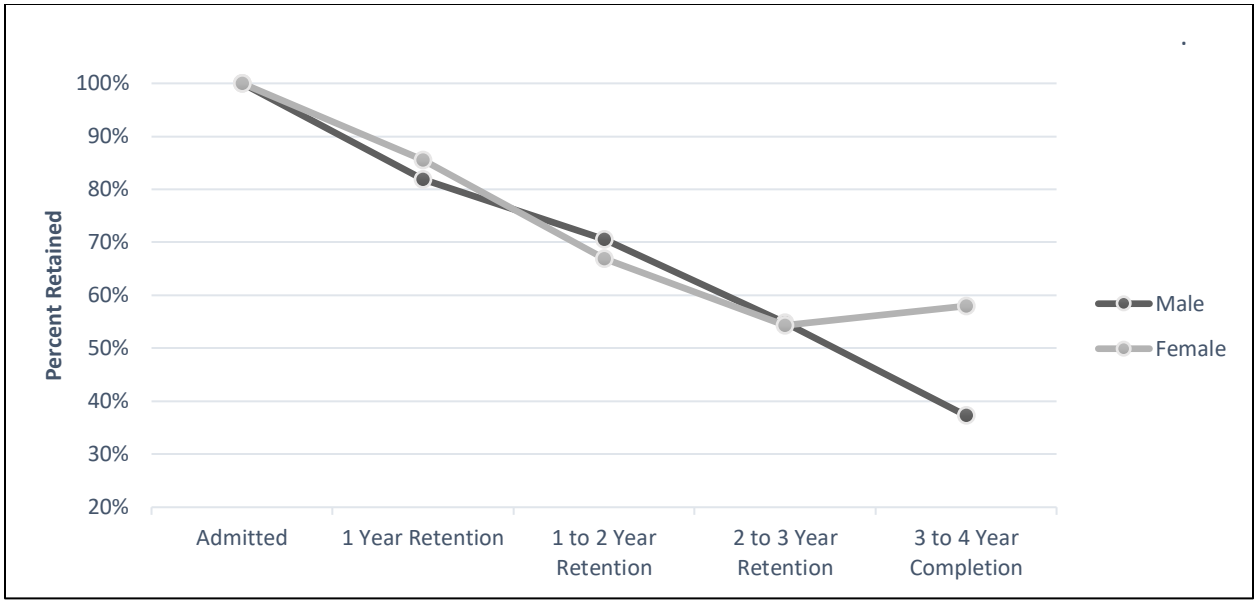
Population: Direct admits and first semester admits admitted to the University between Fall 2013 – Fall 2016, who graduated from the Honors College within four years of their admission to the University

3.4.5 Gender

Although gender is not a predictor of retention, it is a significant predictor of 3-Year Retention to 4-Year Completion and 4-Year Completion. For honors students admitted to the University between Fall 2013 – Fall 2016, the ratio of males to females is 43:57. Out of those students who graduated from the Honors College within four years, the male to female ratio increased to 30:70. The biggest change in the male-to-female ratio occurs during senior year. The retention rates of males and females year-to-year are nearly identical from 1-Year Retention to 2-Year to 3-Year Retention, as depicted in Figure 26. Out of the females retained three years, 58% graduated from the Honors College within the following year. However, out of the males retained three years, only 37% graduated from the Honors College within the following year.

It is uncertain why such a trend would occur. Previously literature has explained why gender gaps occur in higher education, such as women having greater non-cognitive skills, including following directions, working in groups, paying attention in class, and organizing materials (Jacob, 2002). While this may account for the Honors College's gender gap, it does not explain why males have such a lower completion rate than females. This could be a possible area for future research to determine why males have a significantly lower 3-Year Retention to 4-Year Completion and 4-Year Completion rate than females.

Figure 26. Year-to-Year Retention/Completion by Gender

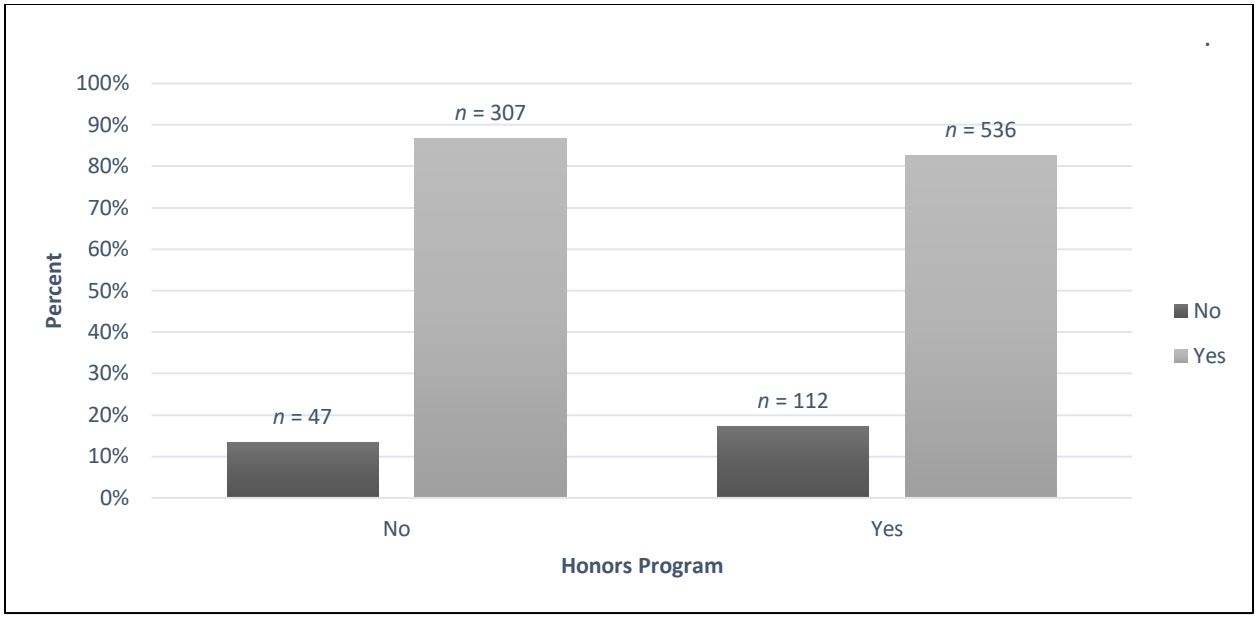


Population: Direct admits and first semester admits admitted to the University between Fall 2013 – Fall 2016, who graduated from the Honors College within four years of their admission to the University

3.4.6 Having an Honors Program

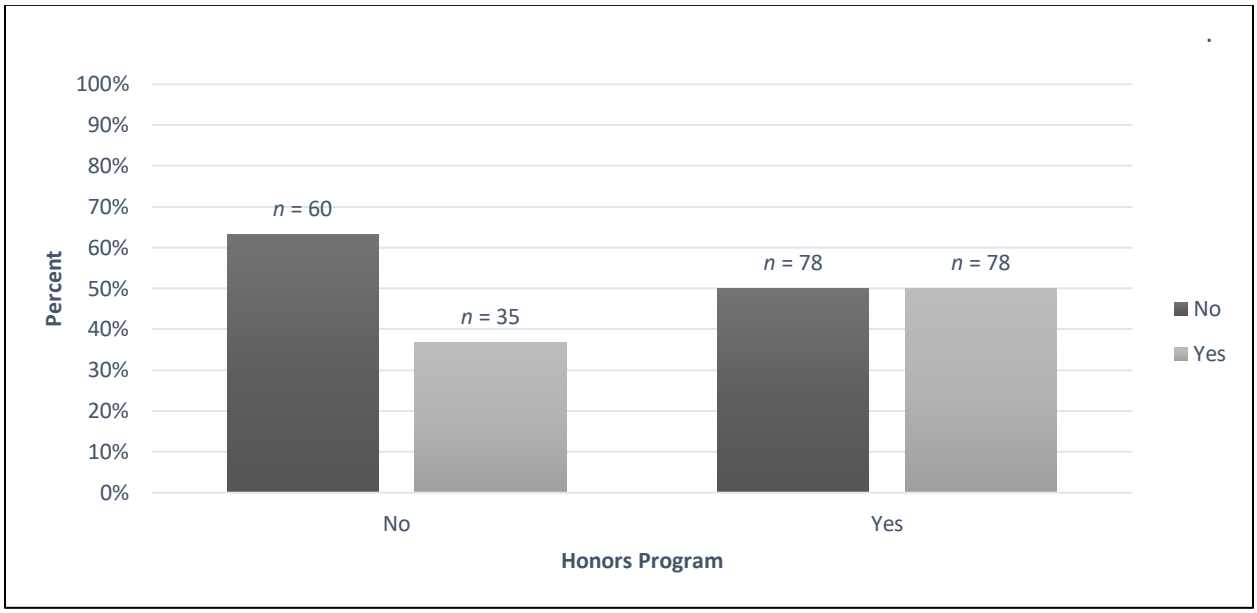
Whether a student's major has a departmental honors program is not a predictor of retention for any of the time frames analyzed. As depicted in Figure 27, there is only a miniscule difference in the retention rates for freshmen with a departmental honors program vs. without a departmental honors program. In terms of completion rates, however, not having an honors program is a significant predictor. For students who retained three years and do not have an honors program, only 37% graduated from the Honors College within a year. Meanwhile, 50% of students with an honors program who retained three years did graduate from the Honors College within a year. This indicates that having an honors program with additional requirements does not necessarily deter students from completing the program. Rather, the structure and support of a program may make a significant difference in students' abilities to complete their honors thesis or creative project during their senior year.

Figure 27. 1-Year Retention Rates by Term 1 Major Honors Program



Population: Direct admits and first semester admits admitted to the University between Fall 2013 – Fall 2019

Figure 28. 3-Year Retention to 4-Year Completion Rates by Term 1 Major Honors Program



Population: Direct admits and first semester admits admitted to the University between Fall 2013 – Fall 2016, who graduated from the Honors College within four years of their admission to the University

3.4.7 Changing Majors

Changing majors was hypothesized to be a predictor of honors retention and completion, assuming that the later into college one changes their major, the more difficult it may be to fulfill all of the new major's requirements and the Honors College's requirements. If a student changes their major junior or senior year, then it may be too late to apply to a departmental honors program and fulfill their graduation requirements. However, changing majors was not significant in any of the regression analyses. Therefore, it seems that major changes at any point in a student's collegiate career does not interfere with meeting Honors College graduation requirements.

3.5 Final Recommendations

Based on the findings from the regression analyses and data visualizations, there are two key recommendations that can be made to the Admissions Office and Honors College administration to improve retention and completion rates. Although the predictors identified for each year of retention will be helpful in monitoring students' paths to success as they progress through the honors program, the ultimate key to success in increasing retention and completion rates may lie in the criteria used to admit students to the Honors College and the timing of admission.

First, given that SAT/ACT Superscore is not a significant predictor of retention or completion, the weight it is given in making admissions decisions for the Honors College should be reevaluated. Not admitting otherwise academically strong students due to a low SAT/ACT Superscore could be unintentionally isolating certain groups of students, such as those who are not strong standardized test-takers. The weak relationship between Superscore and Term 1 GPA

reaffirms the idea that Superscore is not a strong predictor of neither academic performance nor retention and completion specifically for honors students.

A second recommendation is to consider shifting the Honors College admissions model to better utilize Term 1 GPA in admissions decisions. Currently, most honors students are admitted directly to the Honors College before beginning their first semester on campus. Out of the honors students admitted to the University between Fall 2013 – Fall 2019, 83.9% were direct admits, 13.4% were admitted after their first semester, and 2.7% were admitted after their second semester. As a result, most admissions decisions are being made using HSGPA, which is not nearly as strong of a predictor as Term 1 GPA, and SAT/ACT superscore, which is not a significant predictor at all.

If the Honors College were to admit less students directly and more after their first semester, they will be able to make better-informed admissions decisions, utilizing Term 1 GPA to identify students most likely to be successful in the honors program. Since admittance type does not have an impact on retention and completion rates, admitting more students after the first semester should not negatively affect these rates. Additionally, if more students were admitted after their first semester, then the University would have the opportunity to market the Honors College to freshmen when they arrive on campus. This may help spark more interest in the program and even deter some people from applying if they have a better understanding of the program and can recognize it is not the best fit for them.

Before implementing such a change, the University should determine what percentage of incoming honors students would not have committed to UAlbany without their direct acceptance to the Honors College. As mentioned in the introduction of this project, previous research has indicated that approximately half of honors freshmen would have matriculated elsewhere if not

accepted to their college's honors program (as cited in Goodstein & Szarek, 2013). Since this is a general figure, it would be worthwhile to survey UAlbany honors students to determine what influenced their enrollment decision.

Even if the results of such a survey indicate that a high percentage of students would not have enrolled at UAlbany without a spot in the Honors College, it may be possible to find a middle ground. Historically, about 125 freshmen have been directly admitted to the Honors College. This past Fall 2020, however, this figure was nearly doubled to 257 students, with the goal to grow the Honors College. If the University were to revert to admitting only 125 students directly and waited to admit an additional 100-125 after their first semester, this could help achieve the University's goal to continue growing the honors student body, while also increasing the likelihood of student retention and completion by using Term 1 GPA as an admissions factor for nearly half the students. Additionally, if incoming freshmen are aware that nearly half of UAlbany's honors students are not admitted until after their first semester, then more students may apply to join the Honors College once they settle into the University. Overall, changes to the admissions model that increase the use of Term 1 GPA may be beneficial to the Honors College's retention and completion rates, but should not be done without considering other extraneous factors, such as the effect of direct admission on a student's decision to commit to the University.

3.6 Areas for Further Research

The scope of this project is limited to only analyzing one facet of honors student success – retention and completion of the honors program. However, success for honors students can take a variety of forms, with some ultimately preventing a student from completing the honors program. For example, students who graduate early, take on multiple majors, or study for

professional entrance exams may not have enough time to meet their honors program requirements (Goodstein & Szarek, 2013). These students' inability to complete the honors program should not detract from their other successes. Rather, it confirms that the admissions criteria used to admit these students were accurate in selecting high-achieving students. Unfortunately, not all high-achieving students will benefit as much from the Honors College as they will from pursuing these other opportunities, depending on their field of study and future goals. Although it will be impossible for any honors program to achieve 100% retention, it may be beneficial to conduct additional research on which honors students are most likely to experience success in other ways than completing the program. However, even if these students are identified, they should not necessarily be rejected from the Honors College. The benefit honors students receive may be crucial in helping them experience success in other ways, and these successes ultimately boost the University's reputation.

One "success" that may be beneficial to conduct additional research on is identifying students who transfer to another university. Although successful honors students who do not ultimately complete the honors program still benefit the Honors College and University's image, students who transfer out do not. Out of the 556 direct and first semester admits admitted to UAlbany between Fall 2013-2016, 413 did not graduate from the Honors College. Out of the students who did not graduate, 16% did not complete their degree at UAlbany. Identifying whether there are any predictors of honors students leaving the University may help further refine admissions criteria. However, making any admission changes based on the findings should not be done in isolation, as there is a myriad of reasons why a student could transfer out of the University.

Another area where additional research could be conducted is the significance of GPAs over time. Since Term 1 GPA was the strongest predictor of retention and completion, a follow-up study could examine correlations with Term 2 and Term 3 GPAs. Given that a student's academic performance can vary semester to semester, being able to analyze students' GPA performance over time might be an even stronger predictor of year-to-year retention and completion than Term 1 GPA on its own. Additionally, as it was previously mentioned in Section 3.4.5, it may be worthwhile to investigate why there is such a high dropout rate among males during their senior year.

Lastly, it is important to note the influence COVID-19 will have on future research conducted in this area. Most of the data used in this project was collected before COVID-19; the most recent degree completion term in the data set is Winter 2020, and the most recent last active Honors College term is Spring 2021. As a result of the pandemic, many students opted to live off-campus this past academic year of 2020-2021. For students who did live on-campus, there was a significant reduction in on-campus instruction. These changes could negatively affect the Honors College's retention and completion rates. Honors freshmen may have had difficulty connecting with the Honors College community while living off-campus, which could result in a lower retention rate. Additionally, some students may have had difficulty completing their honors thesis or project without access to campus. Therefore, if any future research is conducted that utilizes student data from 2020-2021, then these additional external factors need to be taken into consideration when analyzing retention and completion.

IV. Conclusion

Through the implementation of the student information system and utilization of the regression analysis findings, the Honors College will be able to manage their student records more efficiently and accurately, as well as take actions that could help improve retention and completion rates, respectively. The SIS will allow the Honors College to consolidate and integrate all their student data, providing the functionalities to import data, update data, and extract different views of the data. Significant time that was previously spent manually updating student records and reviewing student performance can now be spent on more valuable activities, such as fundraising and supporting students' pursuit of nationally competitive scholarships. Additionally, the system will enhance the Honors College's course planning process, providing multiple views of past course offerings that will be insightful for future planning. Lastly, the system will help better utilize the Honors College's alumni network. By consolidating all of the data from the future plans surveys, views can now be accessed that group the alumni by those who entered the work force, went on the graduate school, joined a volunteer program, or joined a fellowship program.

Based on the results of the regression analysis, it has been recommended that the Honors College consider reevaluating their admissions criteria and the timing of admittance. Across all five regression analyses, SAT/ACT superscore was one of the worst predictors of retention and completion. Additionally, there is no correlation between honors students' SAT/ACT Superscore and Term 1 GPA. Therefore, since Superscore provides no insight on a student's first semester performance nor the likelihood of their retention and completion within the Honors College, it is recommended to not weigh Superscore as heavily when considering applicants for admission.

Doing so could exclude students who are not strong standardize test takers and may otherwise have great potential to complete the honors program.

Second, it is suggested that the Honors College consider admitting less students directly to the program and admit more after their first semester. Since Term 1 GPA was the strongest predictor of 1-Year Retention, 1-Year to 2-Year Retention, and 4-Year Completion, using this factor in a higher percentage of admissions decisions may have a positive impact on honors retention and completion. Most students are currently directly admitted, with HSGPA and Superscore used as considerations for admittance. Only the small percentage of students admitted after their first or second semester have their Term 1 GPA included with their applications. Since the results of the regression analysis also indicated that there is no significant difference in the retention and completion rates of direct admits vs. first semester admits, it may be worthwhile to consider admitting more students later.

References

Buckley, J., Letukas, L., & Wildavsky, B. (2018). The future of college admissions. In J. Buckley, L. Letukas, & B. Wildavsky (Eds.), *Measuring success: Testing, grades, and the future of college admissions* (pp. 309-312). Johns Hopkins University Press.

Campbell, K. C., & Fuqua, D. R. (2008). Factors predictive of student completion in a collegiate honors program. *Journal of College Student Retention, 10*(2), 129-153. https://doi.org/10.2190/CS.10.2.b

Goodstein, L., & Szarek, P. (2013). They come but do they finish? Program completion for honors students at a major public university, 1998-2010. *Journal of the National Collegiate Honors Council, 14*(2), 85-104. https://digitalcommons.unl.edu/nchcjournal/398/

Gorr, W., & Hossler, D. (2006). Why all the fuss about information systems? Or information systems as golden anchors in higher education. In D. Hossler (Ed.), *Building a student information system: Strategies for success and implications for campus policy makers* (pp. 7-20). Wiley Periodicals, Inc.

Herron, J. (2013). Notes toward an excellent Marxist-Elitist honors admissions policy. *Journal of the National Collegiate Honors Council, 14*(2), 17-44. https://digitalcommons.unl.edu/nchcjournal/390/

Jacobs, B. A. (2002). Where the boys aren't: Non-cognitive skills, returns to school and the gender gap in higher education. *Economics of Education Review, 21*(6), 589-598. https://doi.org/10.1016/S0272-7757(01)00051-6

Macaulay Honors College. (n.d.a). *Good standing and graduation requirements*. Macaulay Student Handbook. https://community.macaulay.cuny.edu/handbook/policies/good-standing-and-graduation-requirements/

Macaulay Honors College. (n.d.b). *Prospective students.* https://macaulay.cuny.edu/prospective-students/

McKay, K. (2009). Predicting retention in honors programs. *Journal of the National Collegiate Honors Council, 10*(1), 77-88. https://digitalcommons.unl.edu/nchcjournal/253/

National Collegiate Honors Council. (2017). *Basic characteristics of a fully developed honors college*. https://www.nchchonors.org/uploaded/NCHC_FILES/PDFs/NCHC_Basic_Characteristics-Program_2017.pdf

Public University Honors. (2020, July 15). *Honors completion rates: Leading honors colleges and programs*. https://publicuniversityhonors.com/2020/07/15/honors-completion-rates-leading-honors-colleges-and-programs/

Sackett, P. R., & Kuncel, N. R. (2018). Eight myths about standardized admissions testing. In J. Buckley, L. Letukas, & B. Wildavsky (Eds.), *Measuring success: Testing, grades, and the future of college admissions* (pp. 13-39). Johns Hopkins University Press.

Satzinger, J., Jackson, R., & Burd, S. (2016). *Systems analysis and design in a changing world.* Cengage Learning.

Savage, H., Raehsler R.D., & Fiedor, J. (2014). An empirical analysis of factors affecting honors program completion rates. *Journal of the National Collegiate Honors Council, 15*(1), 115-128. https://digitalcommons.unl.edu/nchcjournal/428/

Sullivan, L., & Porter, R. (2006). Implementing student information systems. In D. Hossler (Ed.), *Building a student information system: Strategies for success and implications for campus policy makers* (pp. 35-51). Wiley Periodicals, Inc.

University at Albany, SUNY. (n.d.a). *Admissions*. The Honors College. https://www.albany.edu/honors-college/admissions

University at Albany, SUNY. (n.d.b). *Home.* The Honors College. https://www.albany.edu/honors-college

Appendices

A.1 SIS Data Dictionary

Table 35. Data Dictionary

Field	Definition
Abroad Term	Indicates the semester a student went abroad; if field is blank, then they have not gone abroad
Address	A student's address post-graduation
Admit Term	Semester the student was admitted to the University
Admittance Type	Indicates when the student was admitted to the Honors College (Direct = as an incoming freshman, First-Year = during their first year on campus)
Advisor Email	Thesis advisor's email
Alum Email	A student's email post-graduation
Building	Dorm hall a student is assigned to freshman year
Can we contact you?	Indicates whether a student wishes to be contacted after graduation by the Honors College (Yes or No)
Certificate of Completion?	Indicates whether a student has turned in their Certificate of Completion (Yes or No)
Company	The company a graduating senior will be working for
Company Time	Indicates how many hours a week a student is working (full-time or part-time)
Course Catalog Number	Code used to identify a course's name and department (ex: BITM 215)
Course Name	Full name of a course
Course Number	Autogenerated number to identify unique course offerings
Credits	Number of credit hours a course is worth
Cum GPA	The student's cumulative GPA
Date Modified	The date a student's record in the student enrollment primary form was last updated
Date Uploaded to SA	The date the thesis was uploaded to Scholars Archive
Day/Time	The days of the week and times a class was offered
Degree Code	Unique code used to identify a degree assigned by the University (Ex: BUS-INT)
Degree Name	The degree name

Department ID	Auto number used to uniquely identify a department
Department Name	The name of an academic department
Director	The name of the departmental program director
Director Email	The departmental program director's email
Director Updated	The date the director contact information was last updated
Enrollment Status	Indicates whether a student is still enrolled in the Honors College; Active = currently enrolled, Withdrew = student voluntarily left program but still attends UAlbany, Dismissed = student failed to meet program requirements, Transferred = student no longer attends UAlbany
Fellowship Program	Name of the fellowship program a senior will be attending
First Name	The student's first name
General Education ID	Auto number used to uniquely identify a general education requirement
General Education Name	The name of the general education requirement
Gender	Indicated a student's gender (Male, Female, Other)
GPA	The student's semester GPA
Grad Program	The name of the graduate program a student will be enrolling in
Grad School	The name of the college or university a student will be attending post-graduation
Grad School Time	Indicates how many hours a week a student is attending grad school (full-time or part-time)
Grade	The grade a student earned in a class
HC Admit Term	The term a student was admitted to the Honors College
HC Last Term	The last term a student was active in the Honors College
Honors Program ID	Auto number used to uniquely identify an honors program
Housing Type	Indicates a student's freshman housing type; Honors = lived in honors housing (Steinmetz or Melville), Non-Honors = lived on-campus in non-honors housing; Commuter = lives off-campus
Key Words	The key words associated with a student's thesis
Last Name	The student's last name
Leave of Absence Term	Indicates the semester a student was on leave; if the field is blank, then they have not taken a leave of absence

Location	The classroom a course was taught in
Major ID	Auto number used to uniquely identify a major
Major Name	The name of a major
Major1	The student's primary major
Major2	The student's secondary major (if applicable)
Notes	Additional notes taken on a student
Number of Events	The number of honors events a student attended in a given semester
Personal Email	A student's personal email provided by the Admissions Office
Phone Number	The student's phone number
Position	The student's position in the company
Probation Term	Indicates the semester a student was on probation; if the field is blank, then they have not been on probation
Professor Email	The professor's email
Professor ID	Auto number used to uniquely identify a professor
Professor Name	The name of the professor
Program Name	The name of the graduate program a student in enrolling in
SA Status	Indicated whether a thesis has been published, removed, or should not be uploaded
School ID	Auto number used to uniquely identify a school/college
School/College Name	Name of the school/college
Term	The semester name (season – year)
Term ID	ID used to distinguish semesters, assigned by the University
Term Inactive	Indicates when a general education requirement was retired; 10000 = still active
Thesis Advisor	Name of a student's thesis advisor
Thesis Notes	Additional notes on a student's thesis
Thesis Title	Title of the thesis
Time	Full or part time for work or grad school

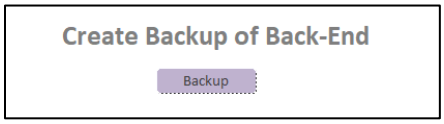
Time Modified	The time a student's record in the student enrollment primary form was last updated
UAlbany Email	The student's institutional email
UAlbanyID	The student's unique ID number assigned by UAlbany (Format: 00XXXXXXX)
Volunteer Organization	The name of the organization a student is volunteering with

A.2 User Interfaces

A.2.1 Homepages

Figure 29. Front-End Homepage

Figure 30. Back-End Homepage



A.2.2 Student Enrollment Subsystem

Figure 31. Student Enrollment Landing Page

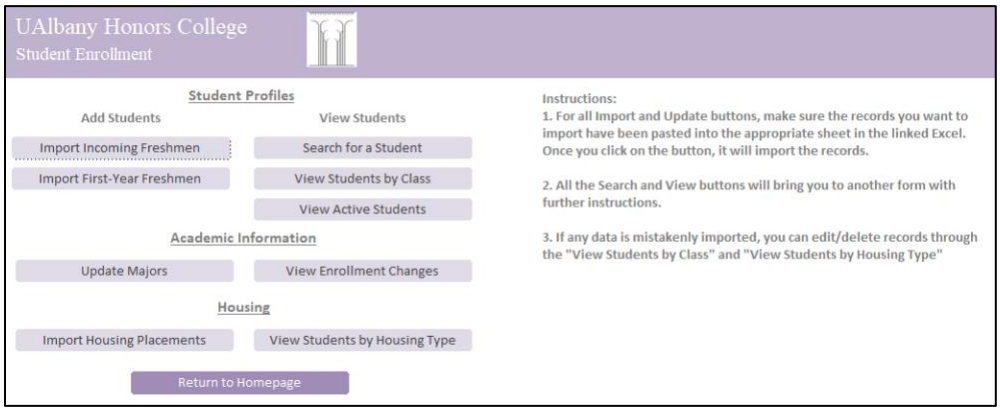


Figure 32. Search for a Student Form

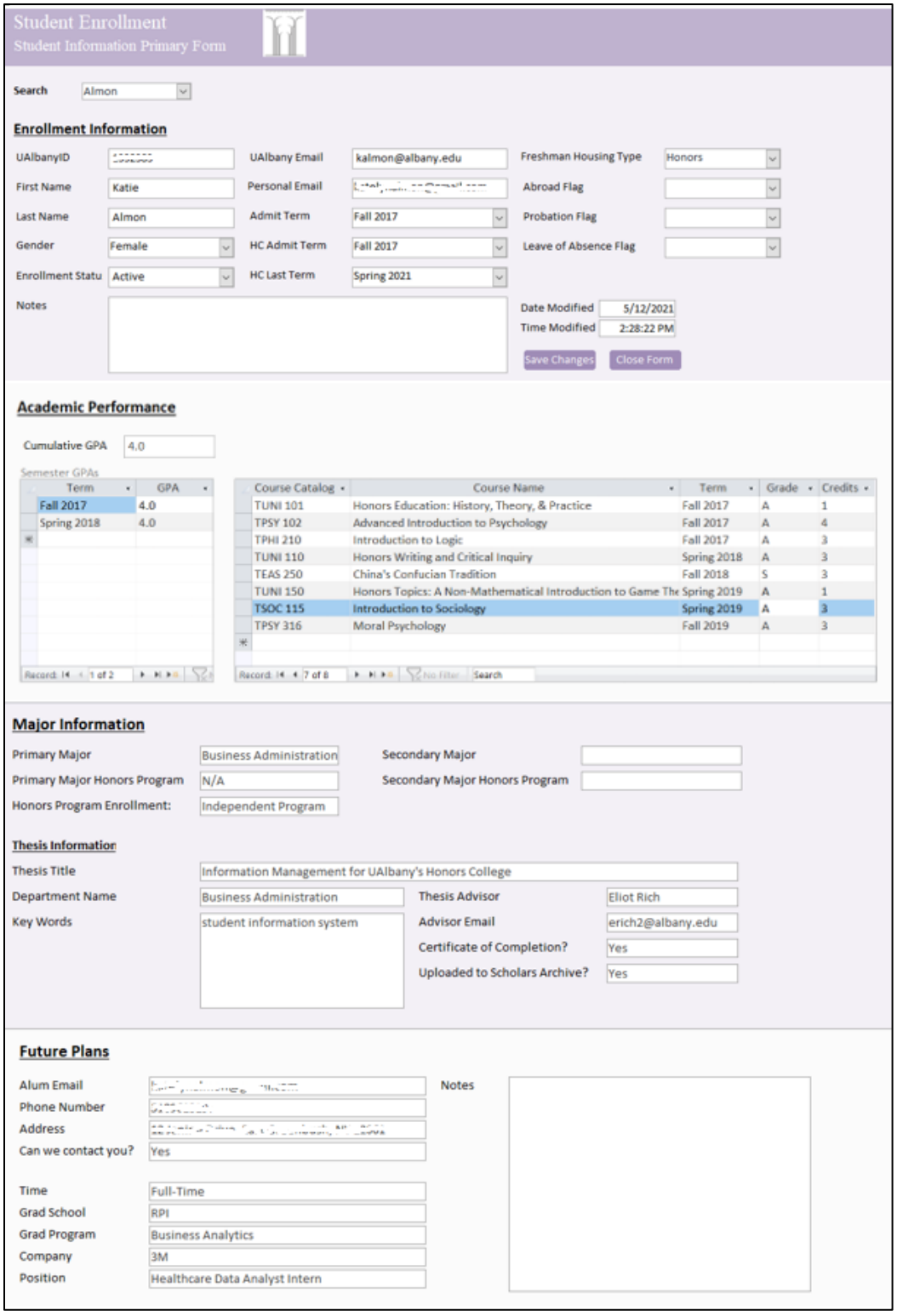


Figure 33. View Students by Class Query

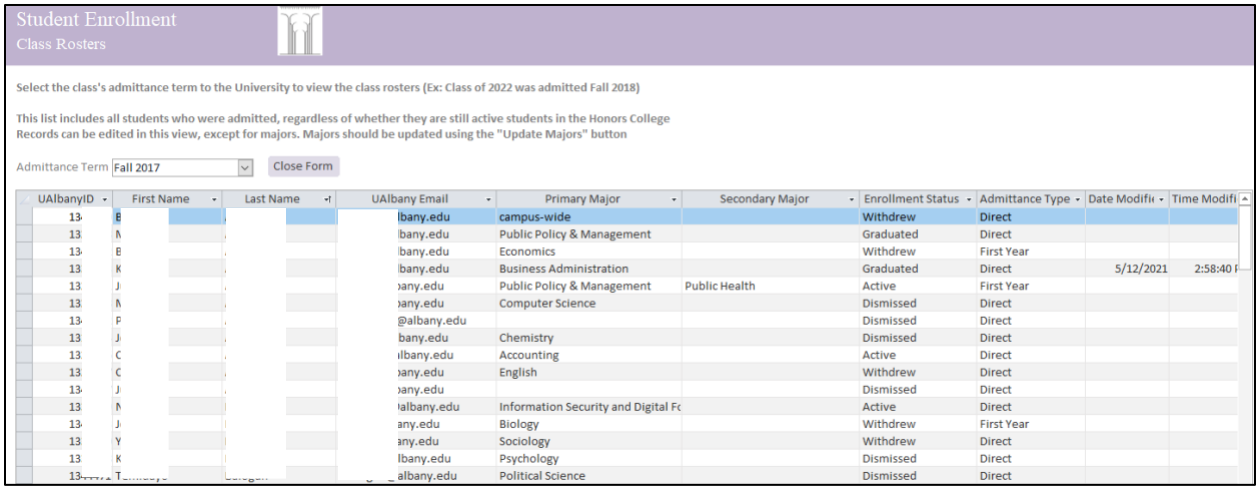


Figure 34. View Active Students Query

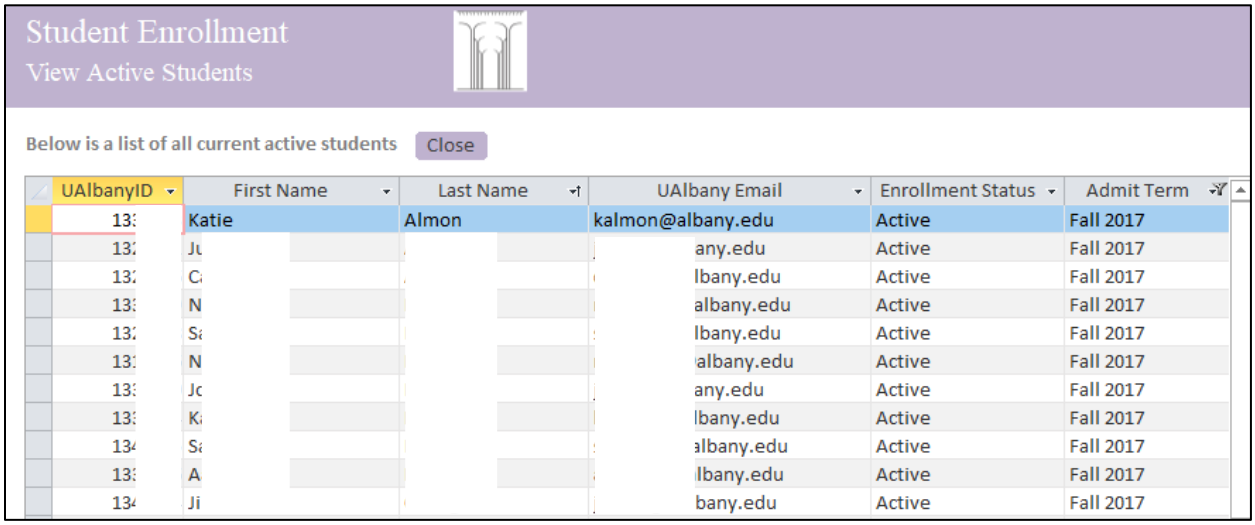


Figure 35. View Enrollment Changes Query

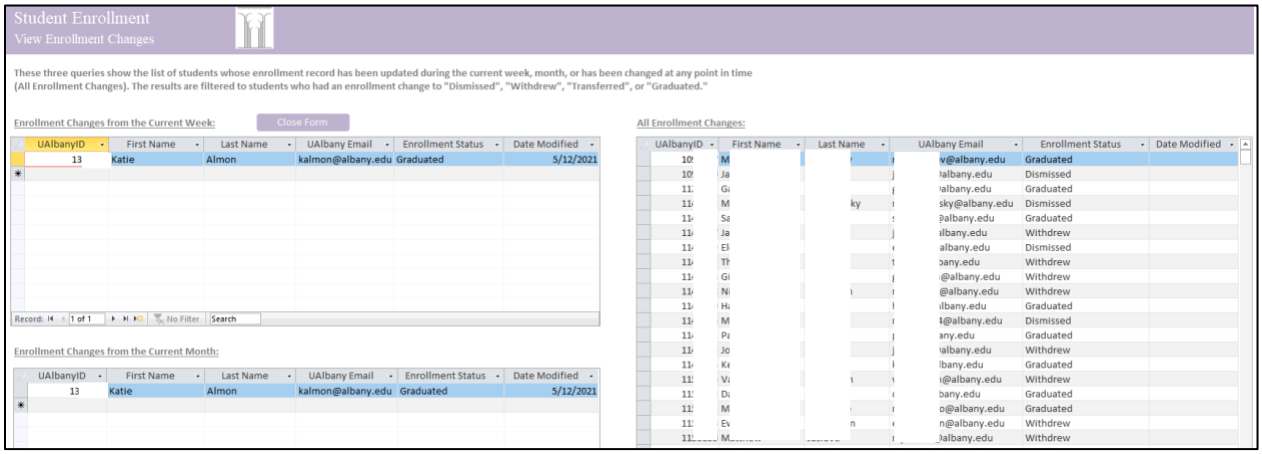
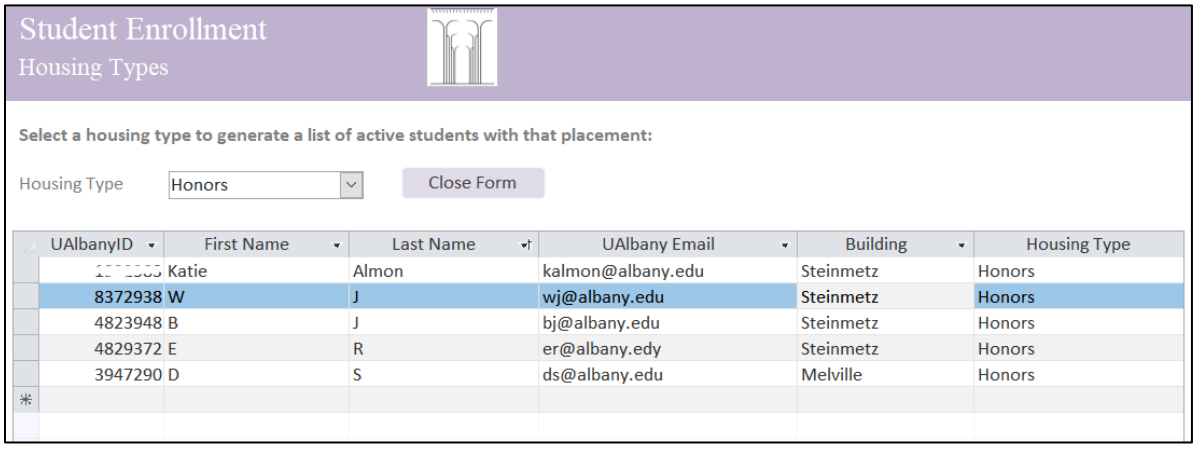


Figure 36. View Students by Housing Type Query



A.2.3 Academic Performance Subsystem

Figure 37. Academic Performance Landing Page

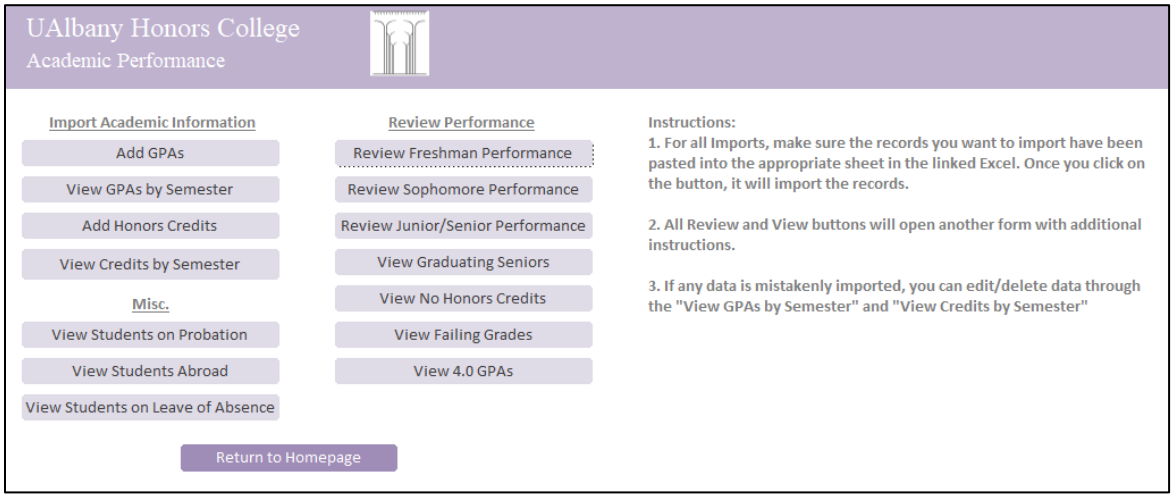


Figure 38. View GPAs by Semester

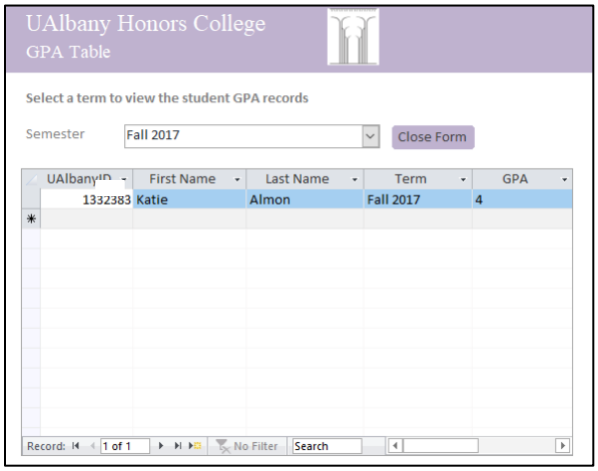


Figure 39. View Honors Credits by Semester

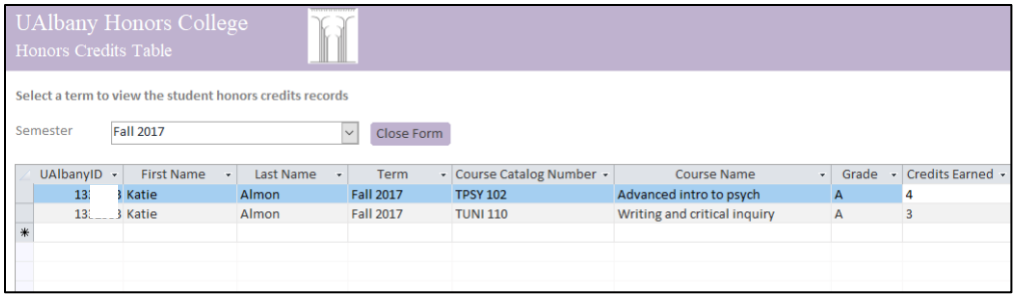


Figure 40. Review Freshman Performance Query

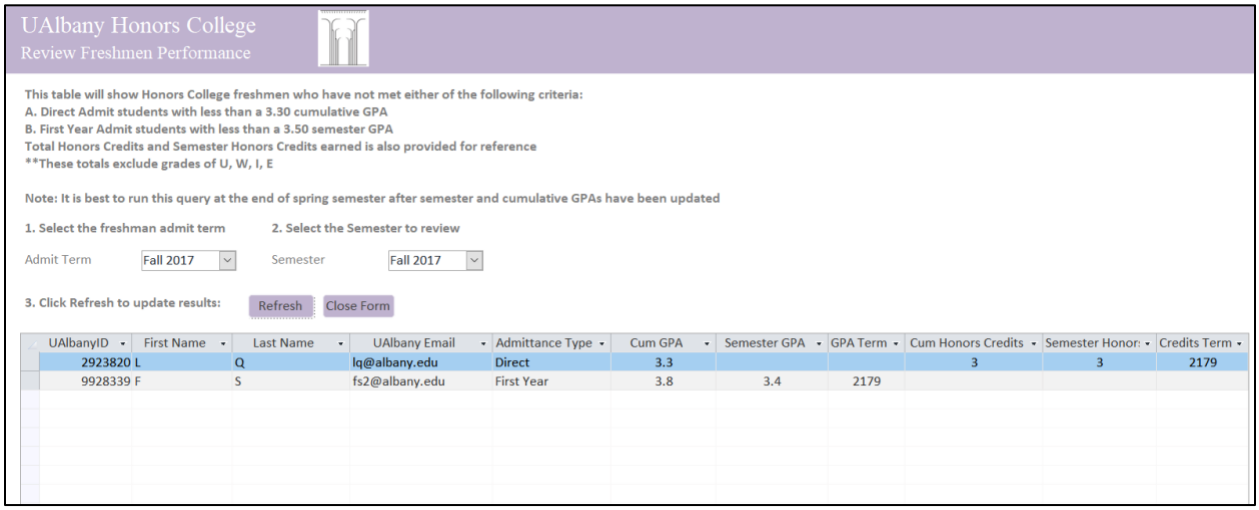


Figure 41. Review Sophomore Performance Query

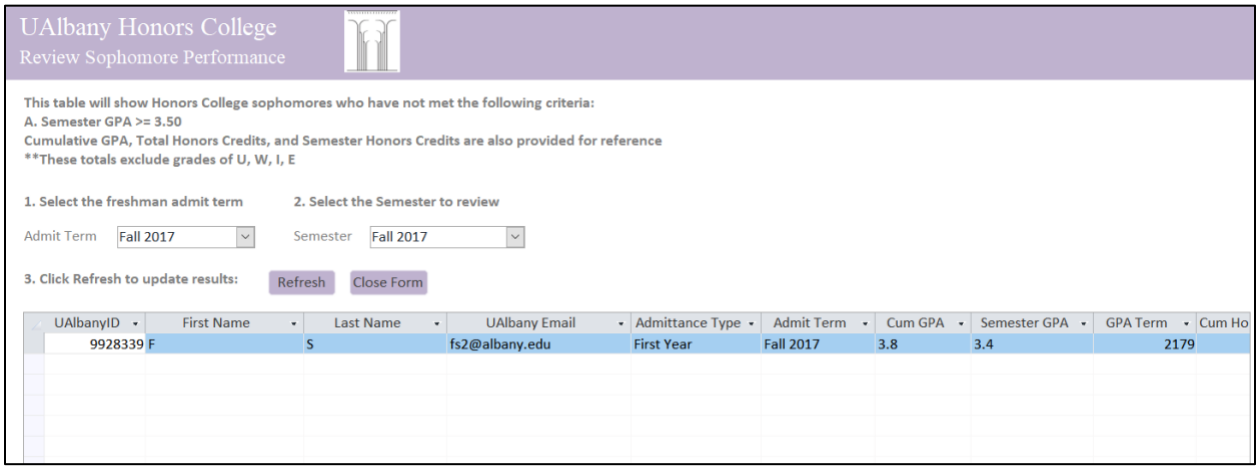


Figure 42. Review Junior/Senior Performance Query

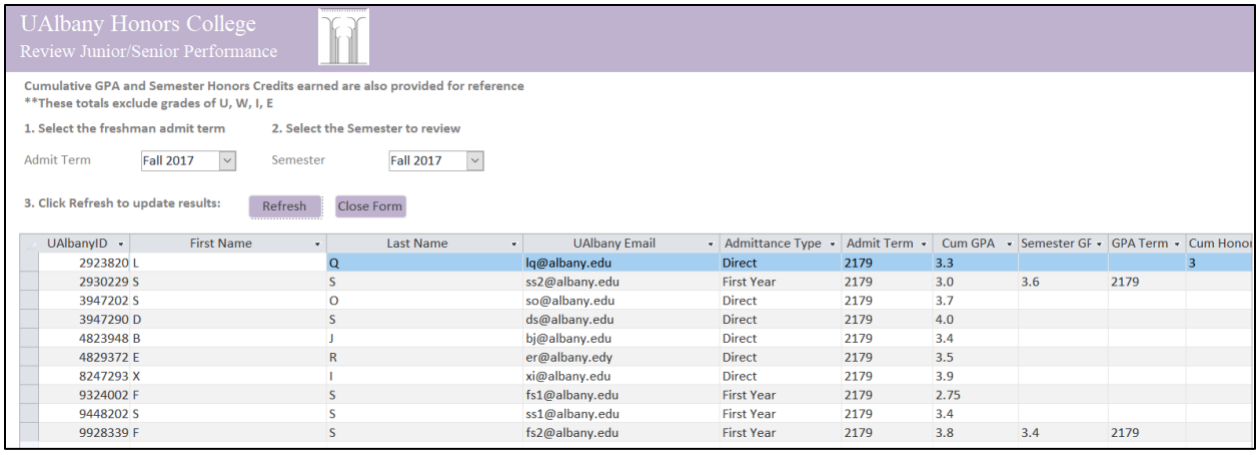


Figure 43. Review Graduating Seniors Query

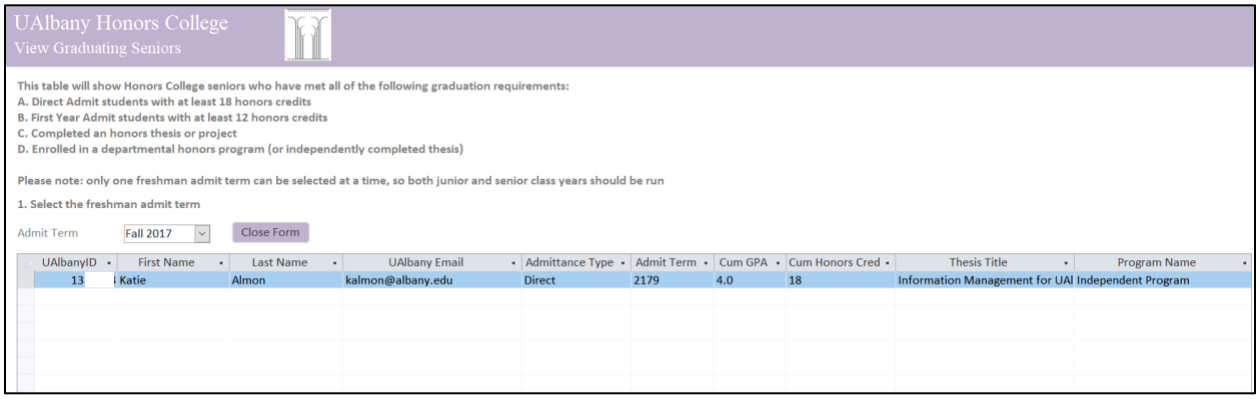


Figure 44. View No Honors Credits Query

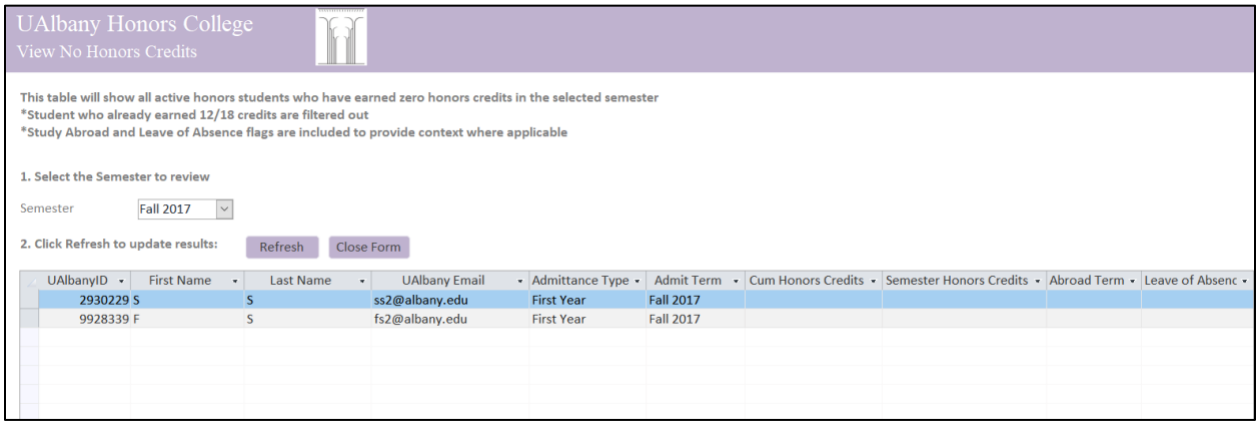


Figure 45. View Failing Grades

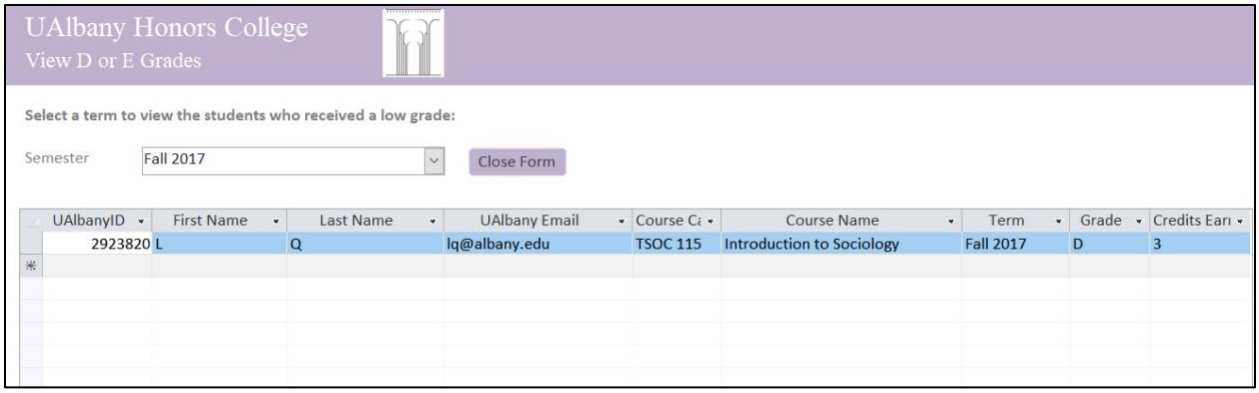


Figure 46. View 4.0 GPAs Query

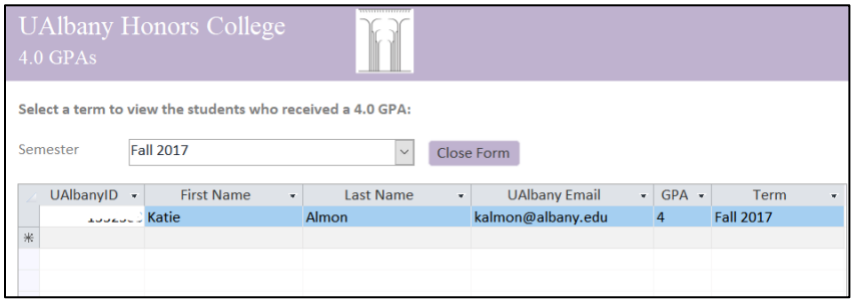


Figure 47. View Students on Probation Query

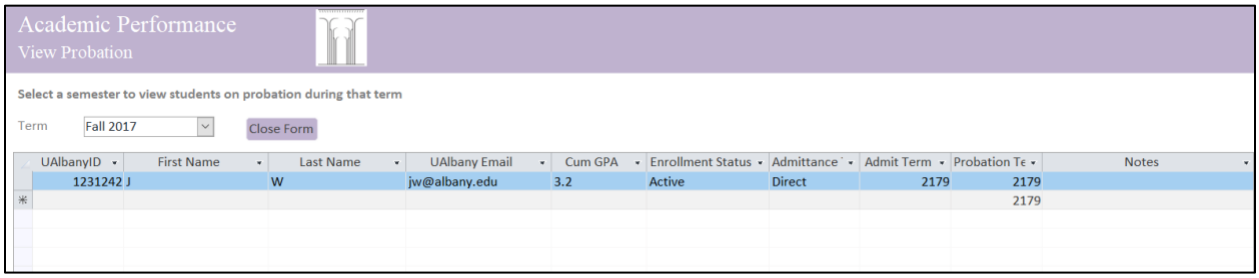


Figure 48. View Students Abroad Query

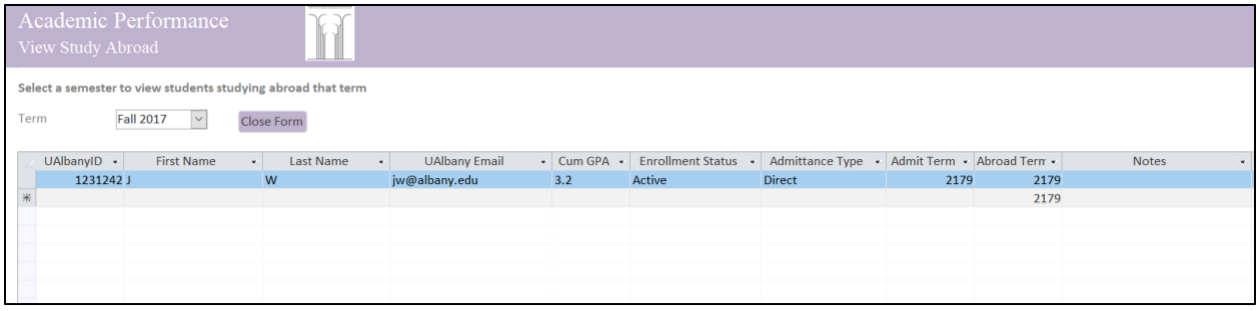
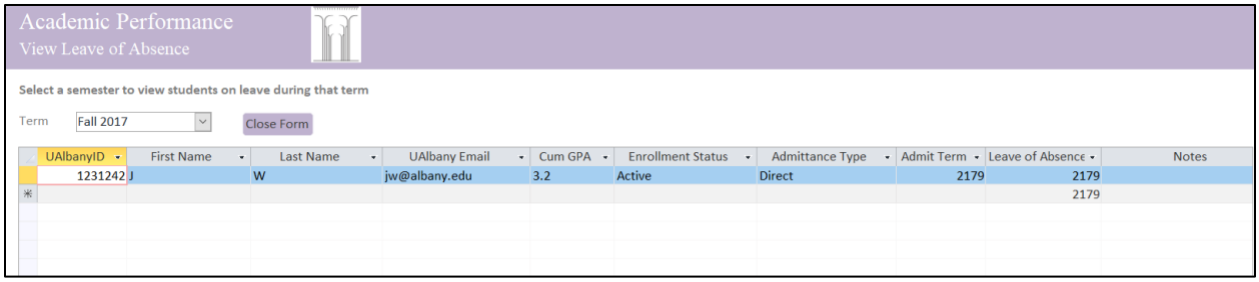


Figure 49. View Students on Leave of Absence Query



A.2.4 Course Management Subsystem

Figure 50. Course Management Landing Page

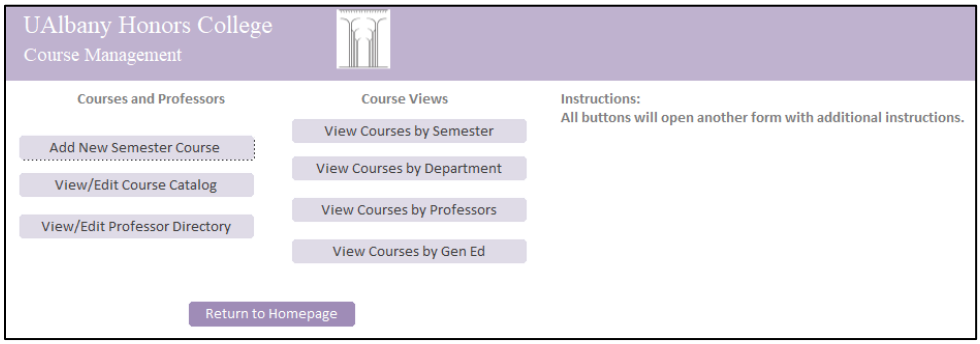


Figure 51. Add New Semester Course Offerings Form

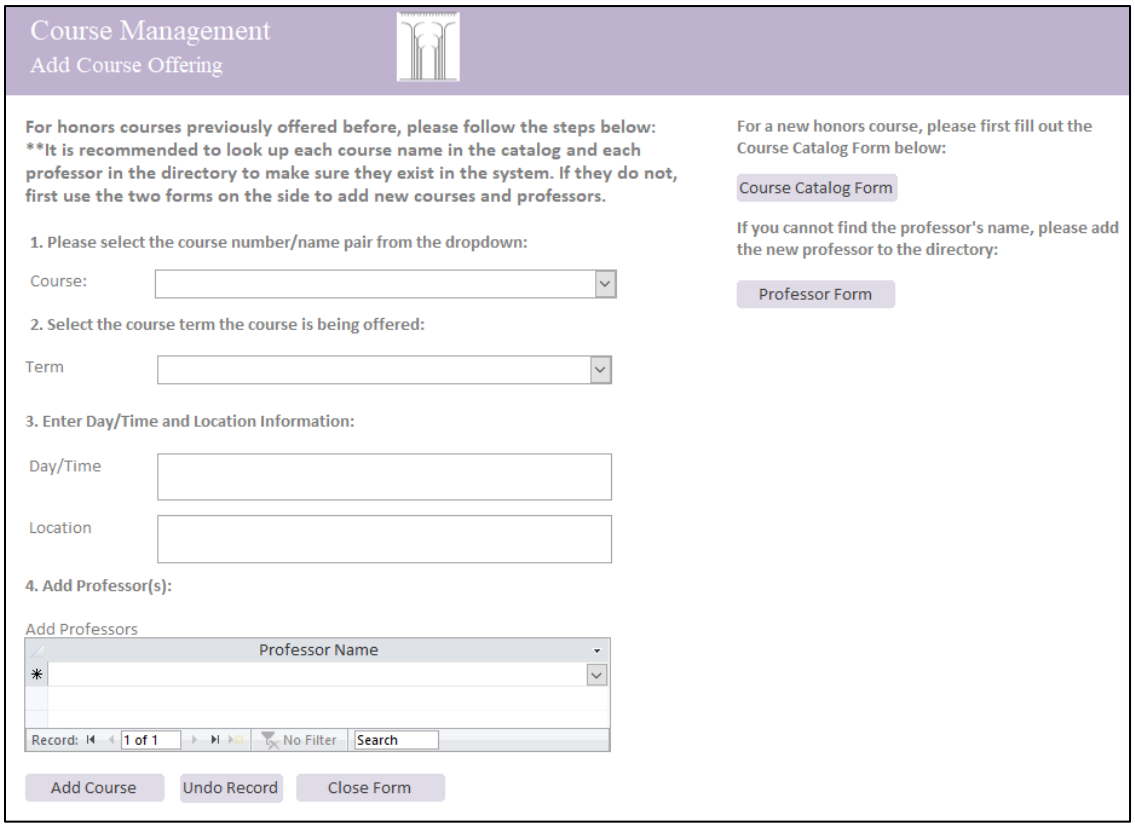


Figure 52. Create New Honors Course Form

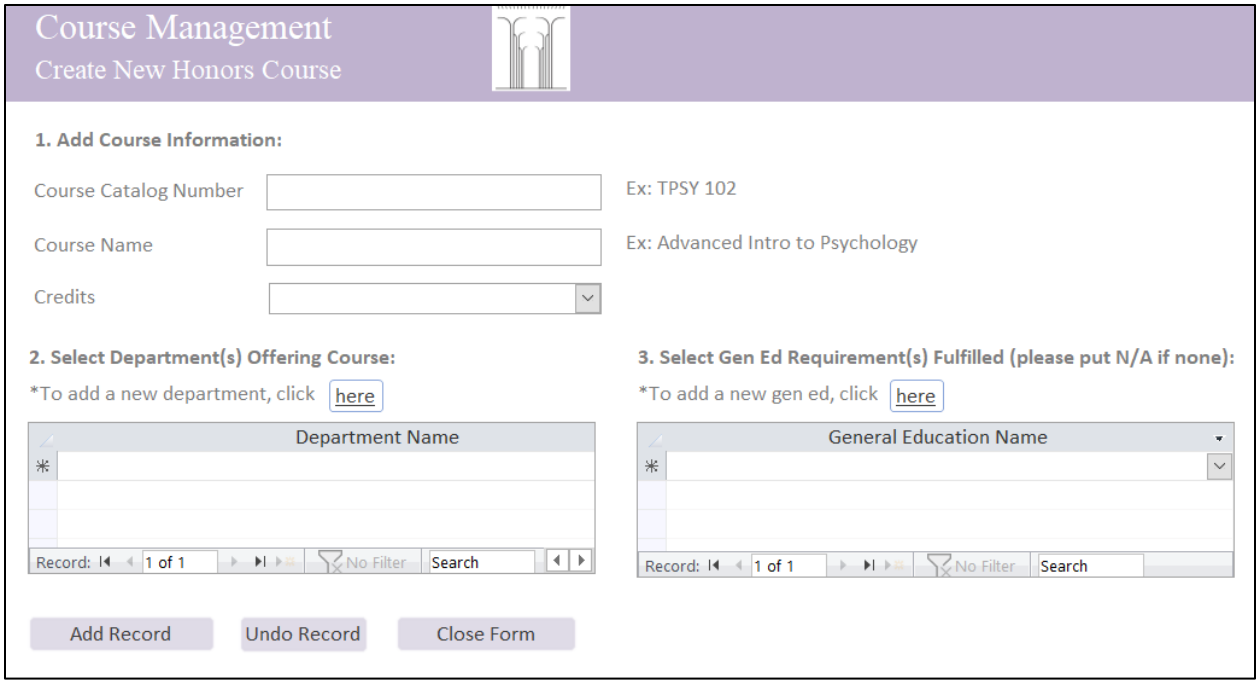


Figure 53. Add Professor Form

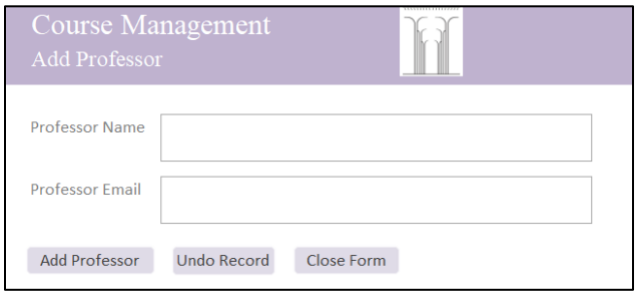
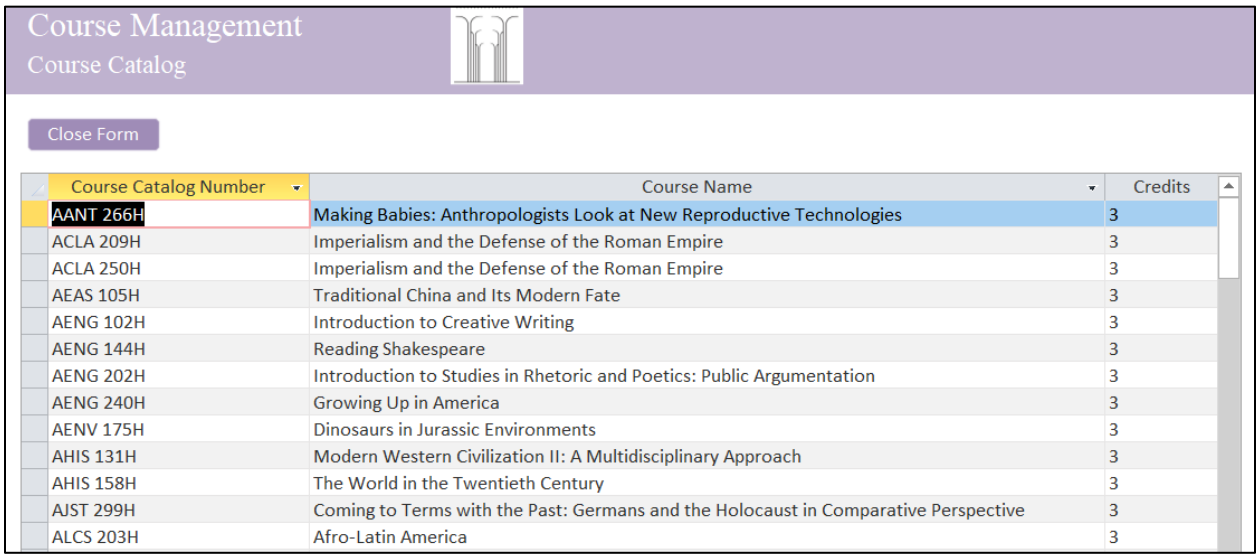


Figure 54. View/Edit Course Catalog Form



Course Catalog Number	Course Name	Credits
AANT 266H	Making Babies: Anthropologists Look at New Reproductive Technologies	3
ACLA 209H	Imperialism and the Defense of the Roman Empire	3
ACLA 250H	Imperialism and the Defense of the Roman Empire	3
AEAS 105H	Traditional China and Its Modern Fate	3
AENG 102H	Introduction to Creative Writing	3
AENG 144H	Reading Shakespeare	3
AENG 202H	Introduction to Studies in Rhetoric and Poetics: Public Argumentation	3
AENG 240H	Growing Up in America	3
AENV 175H	Dinosaurs in Jurassic Environments	3
AHIS 131H	Modern Western Civilization II: A Multidisciplinary Approach	3
AHIS 158H	The World in the Twentieth Century	3
AJST 299H	Coming to Terms with the Past: Germans and the Holocaust in Comparative Perspective	3
ALCS 203H	Afro-Latin America	3

Figure 55. View/Edit Professor Directory Form

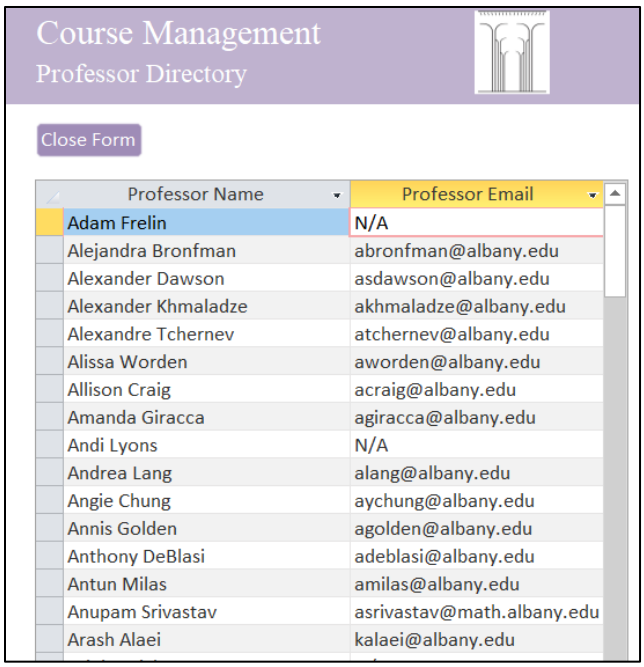


Figure 56. View Courses by Semester Query

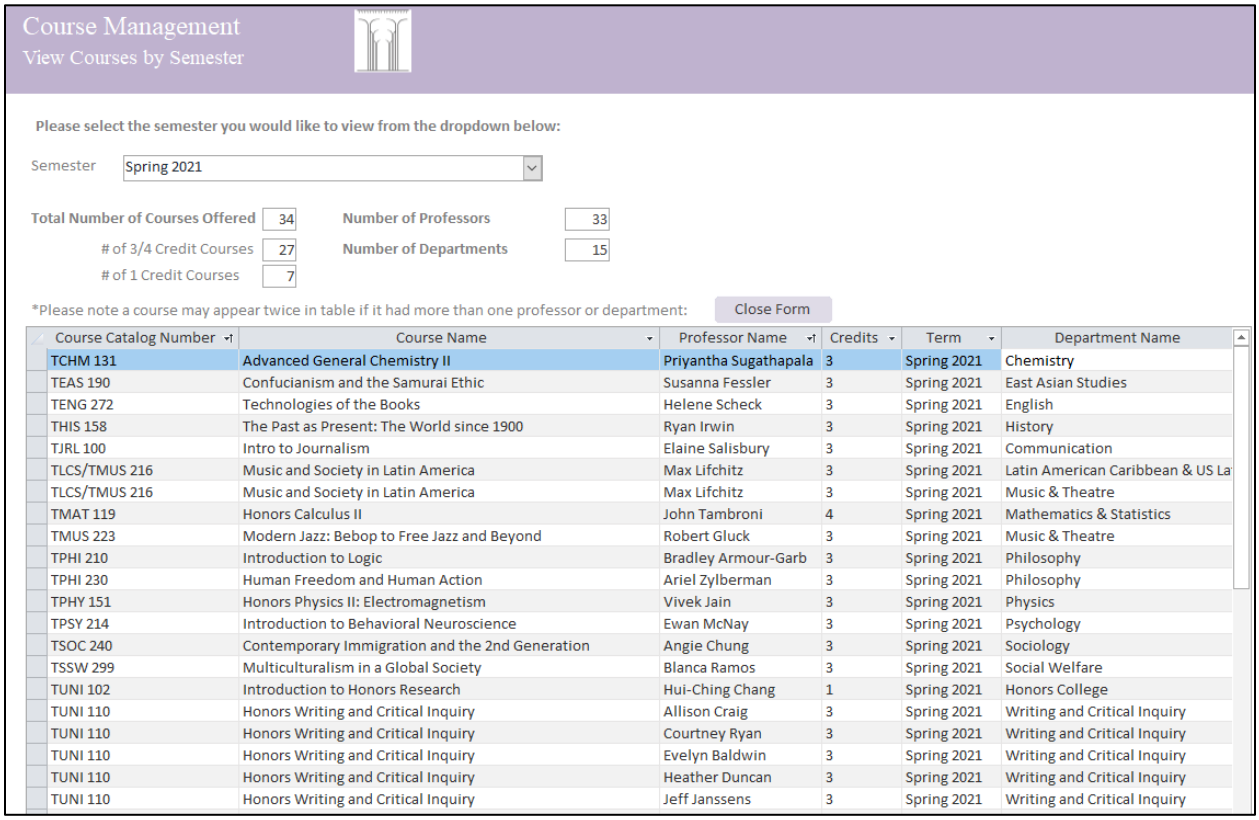
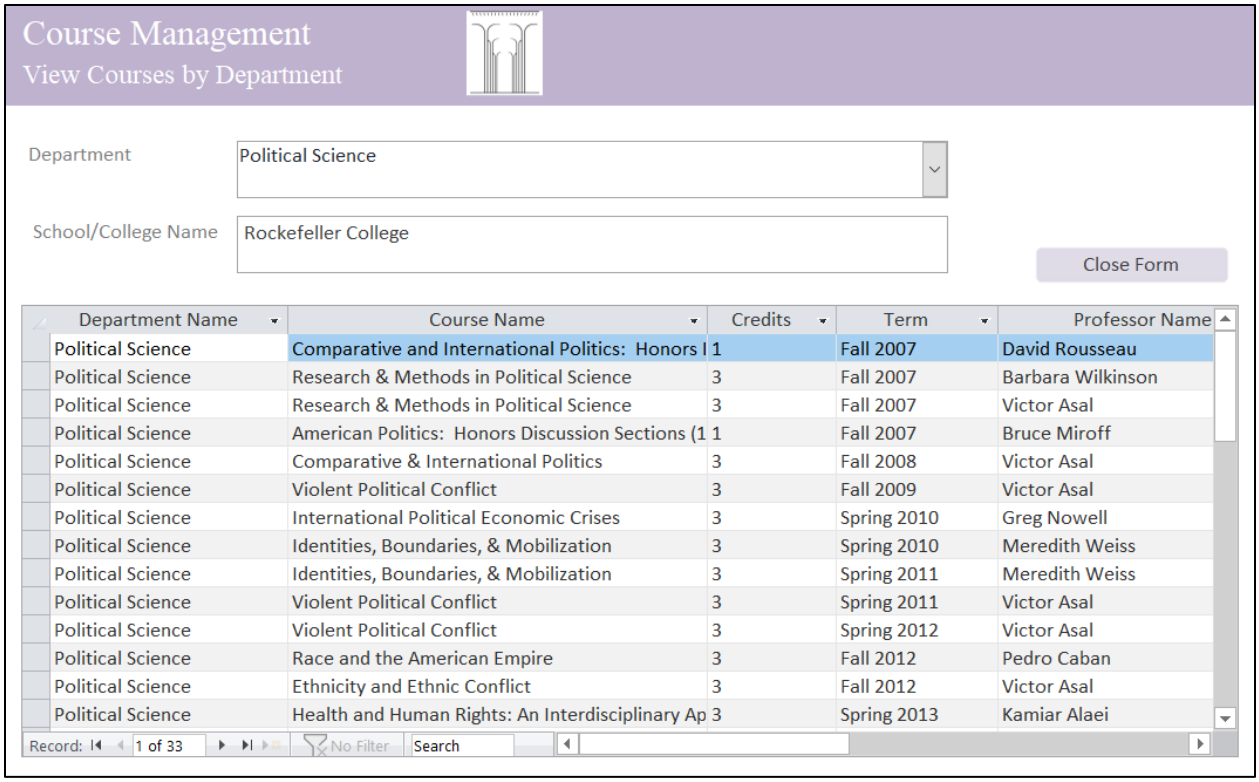


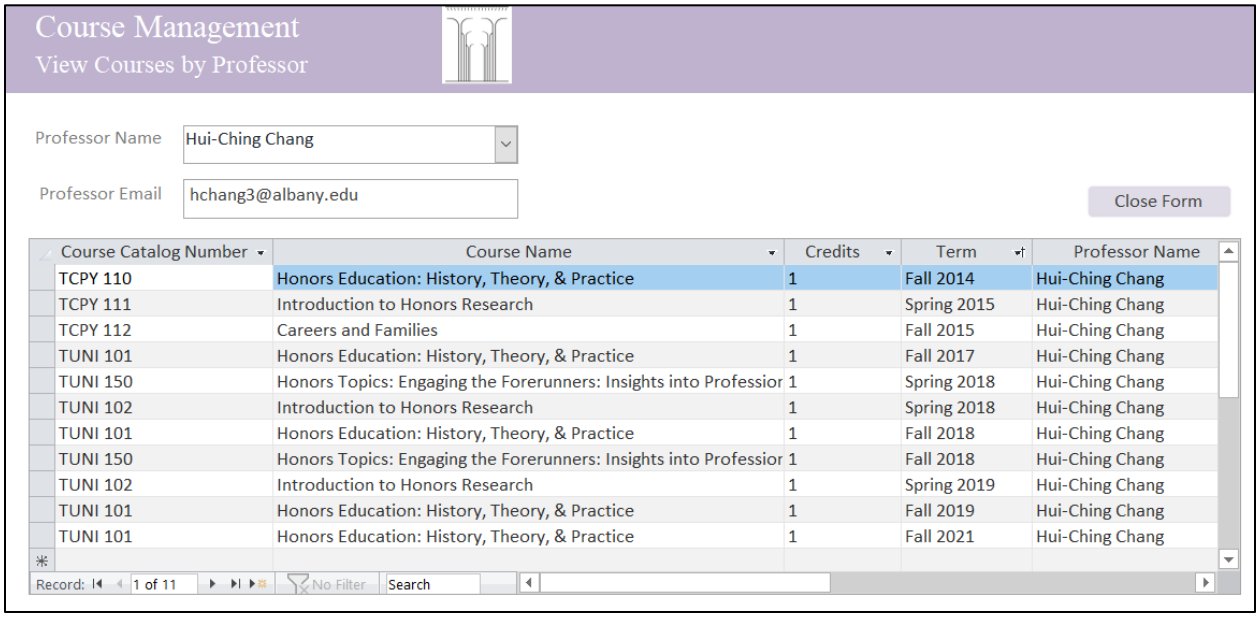
Figure 57. View Courses by Department Query



Department Name	Course Name	Credits	Term	Professor Name
Political Science	Comparative and International Politics: Honors I	1	Fall 2007	David Rousseau
Political Science	Research & Methods in Political Science	3	Fall 2007	Barbara Wilkinson
Political Science	Research & Methods in Political Science	3	Fall 2007	Victor Asal
Political Science	American Politics: Honors Discussion Sections (1	1	Fall 2007	Bruce Miroff
Political Science	Comparative & International Politics	3	Fall 2008	Victor Asal
Political Science	Violent Political Conflict	3	Fall 2009	Victor Asal
Political Science	International Political Economic Crises	3	Spring 2010	Greg Nowell
Political Science	Identities, Boundaries, & Mobilization	3	Spring 2010	Meredith Weiss
Political Science	Identities, Boundaries, & Mobilization	3	Spring 2011	Meredith Weiss
Political Science	Violent Political Conflict	3	Spring 2011	Victor Asal
Political Science	Violent Political Conflict	3	Spring 2012	Victor Asal
Political Science	Race and the American Empire	3	Fall 2012	Pedro Caban
Political Science	Ethnicity and Ethnic Conflict	3	Fall 2012	Victor Asal
Political Science	Health and Human Rights: An Interdisciplinary Ap	3	Spring 2013	Kamiar Alaei

Record: 1 of 33 No Filter Search

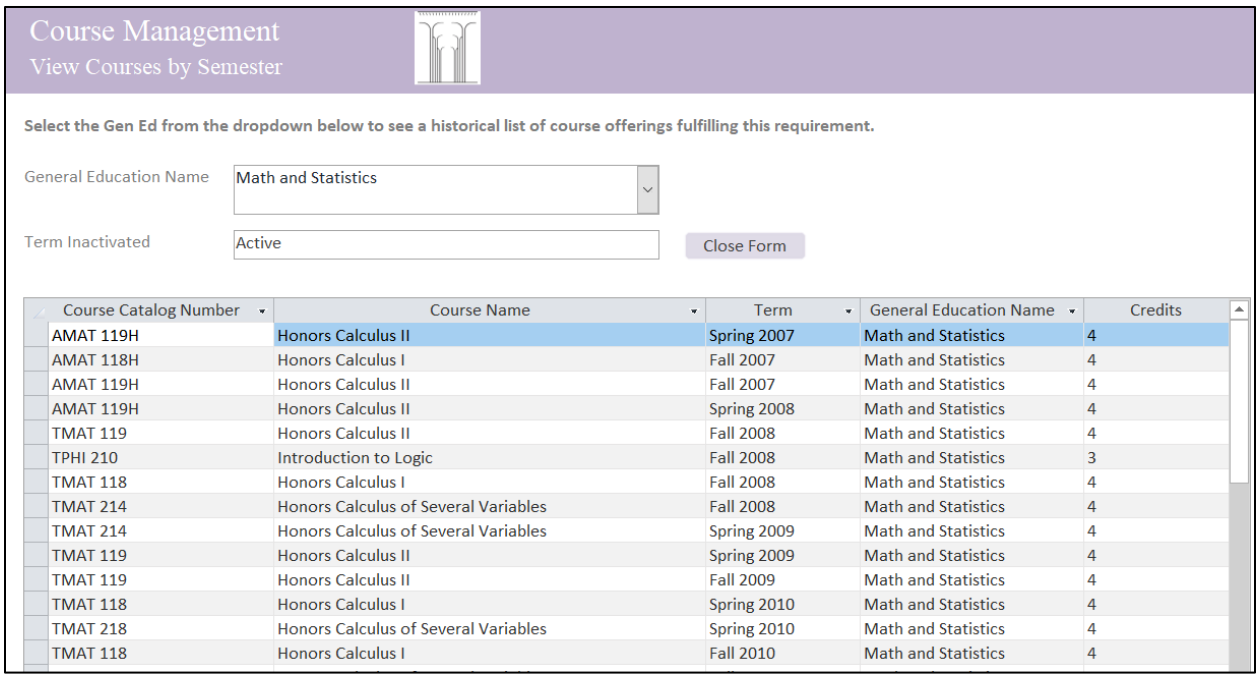
Figure 58. View Courses by Professor Query



Course Catalog Number	Course Name	Credits	Term	Professor Name
TCPY 110	Honors Education: History, Theory, & Practice	1	Fall 2014	Hui-Ching Chang
TCPY 111	Introduction to Honors Research	1	Spring 2015	Hui-Ching Chang
TCPY 112	Careers and Families	1	Fall 2015	Hui-Ching Chang
TUNI 101	Honors Education: History, Theory, & Practice	1	Fall 2017	Hui-Ching Chang
TUNI 150	Honors Topics: Engaging the Forerunners: Insights into Professior	1	Spring 2018	Hui-Ching Chang
TUNI 102	Introduction to Honors Research	1	Spring 2018	Hui-Ching Chang
TUNI 101	Honors Education: History, Theory, & Practice	1	Fall 2018	Hui-Ching Chang
TUNI 150	Honors Topics: Engaging the Forerunners: Insights into Professior	1	Fall 2018	Hui-Ching Chang
TUNI 102	Introduction to Honors Research	1	Spring 2019	Hui-Ching Chang
TUNI 101	Honors Education: History, Theory, & Practice	1	Fall 2019	Hui-Ching Chang
TUNI 101	Honors Education: History, Theory, & Practice	1	Fall 2021	Hui-Ching Chang

Record: 1 of 11 No Filter Search

Figure 59. View Courses by Gen Ed Query



Course Catalog Number	Course Name	Term	General Education Name	Credits
AMAT 119H	Honors Calculus II	Spring 2007	Math and Statistics	4
AMAT 118H	Honors Calculus I	Fall 2007	Math and Statistics	4
AMAT 119H	Honors Calculus II	Fall 2007	Math and Statistics	4
AMAT 119H	Honors Calculus II	Spring 2008	Math and Statistics	4
TMAT 119	Honors Calculus II	Fall 2008	Math and Statistics	4
TPHI 210	Introduction to Logic	Fall 2008	Math and Statistics	3
TMAT 118	Honors Calculus I	Fall 2008	Math and Statistics	4
TMAT 214	Honors Calculus of Several Variables	Fall 2008	Math and Statistics	4
TMAT 214	Honors Calculus of Several Variables	Spring 2009	Math and Statistics	4
TMAT 119	Honors Calculus II	Spring 2009	Math and Statistics	4
TMAT 119	Honors Calculus II	Fall 2009	Math and Statistics	4
TMAT 118	Honors Calculus I	Spring 2010	Math and Statistics	4
TMAT 218	Honors Calculus of Several Variables	Spring 2010	Math and Statistics	4
TMAT 118	Honors Calculus I	Fall 2010	Math and Statistics	4

A.2.5 Departmental Honors Subsystem

Figure 60. Departmental Honors Landing Page

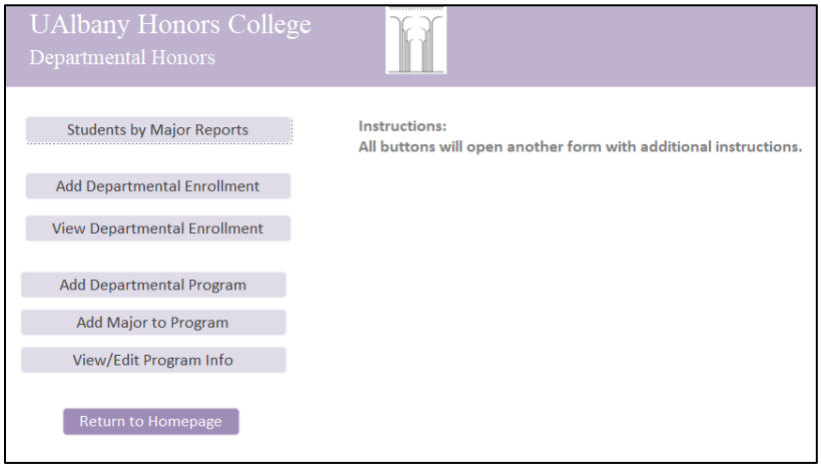


Figure 61. View Students by Major Query

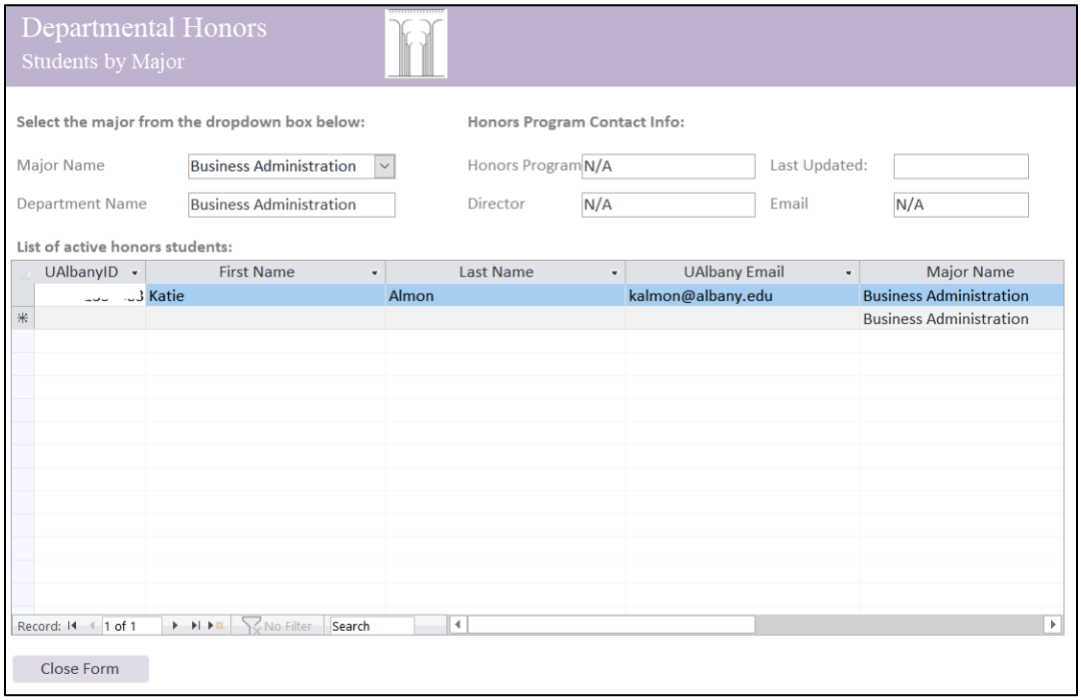


Figure 62. Add Departmental Enrollment Form

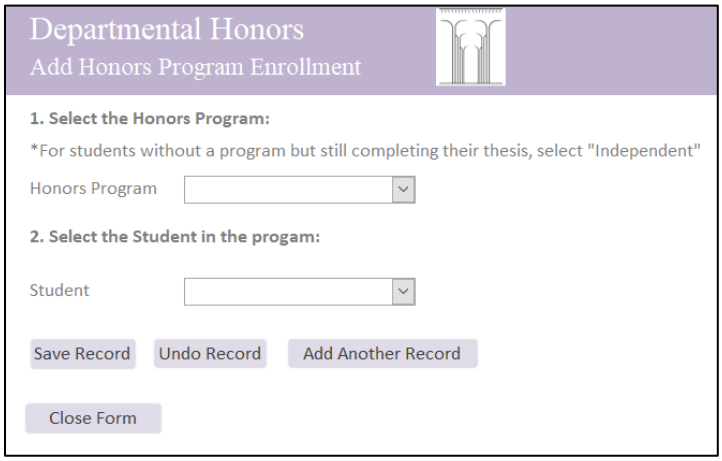


Figure 63. View Departmental Enrollment Query

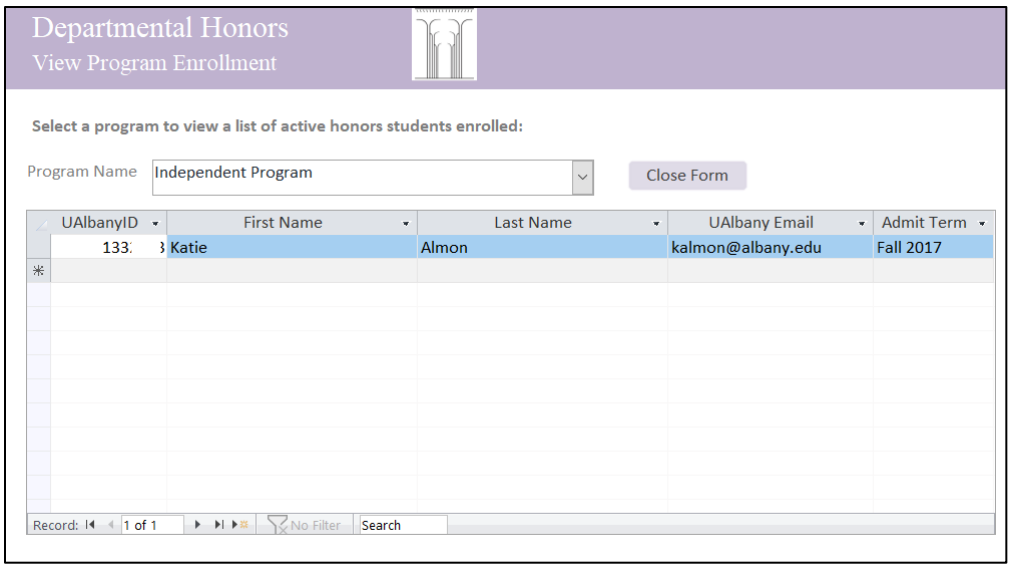


Figure 64. Add Departmental Program Form

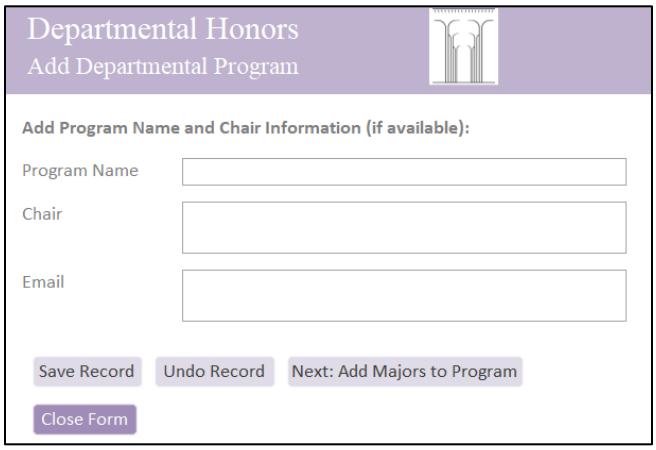


Figure 65. Add Major to Program Form

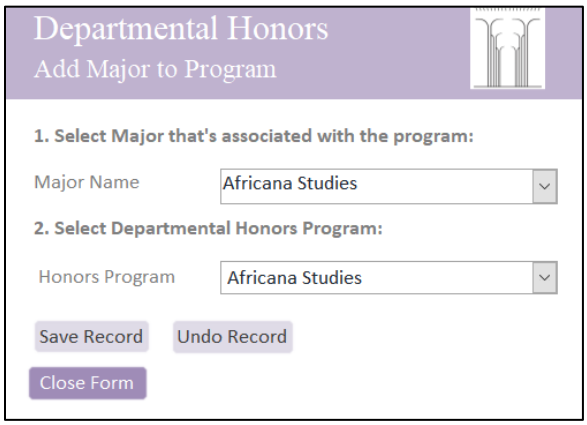
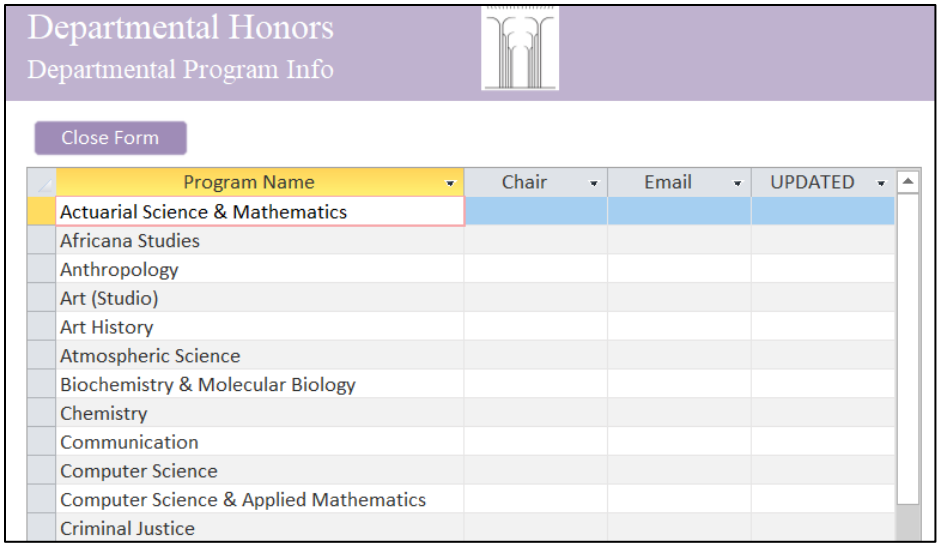


Figure 66. View/Edit Program Information Form



A.2.6 Theses & Future Plans Subsystem

Figure 67. Theses & Future Plans Landing Page

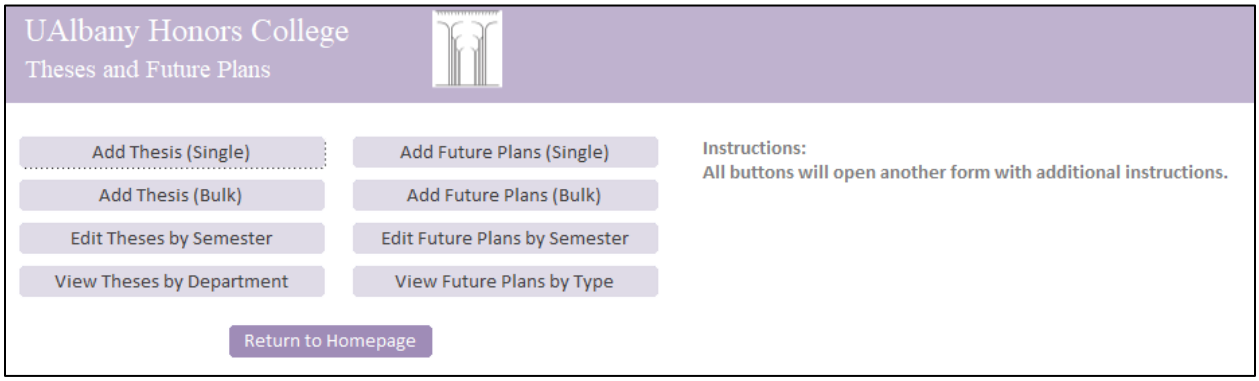


Figure 68. Add Thesis Form

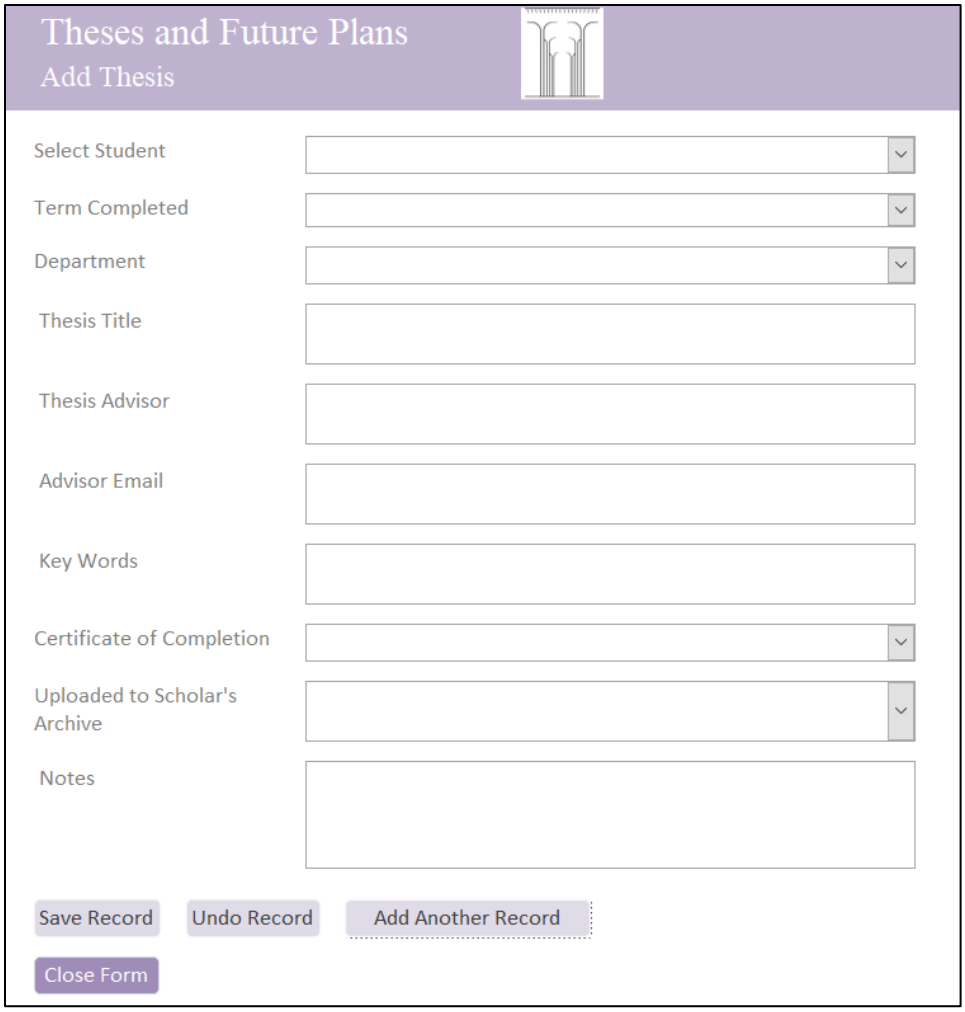


Figure 69. Edit Theses by Semester Query

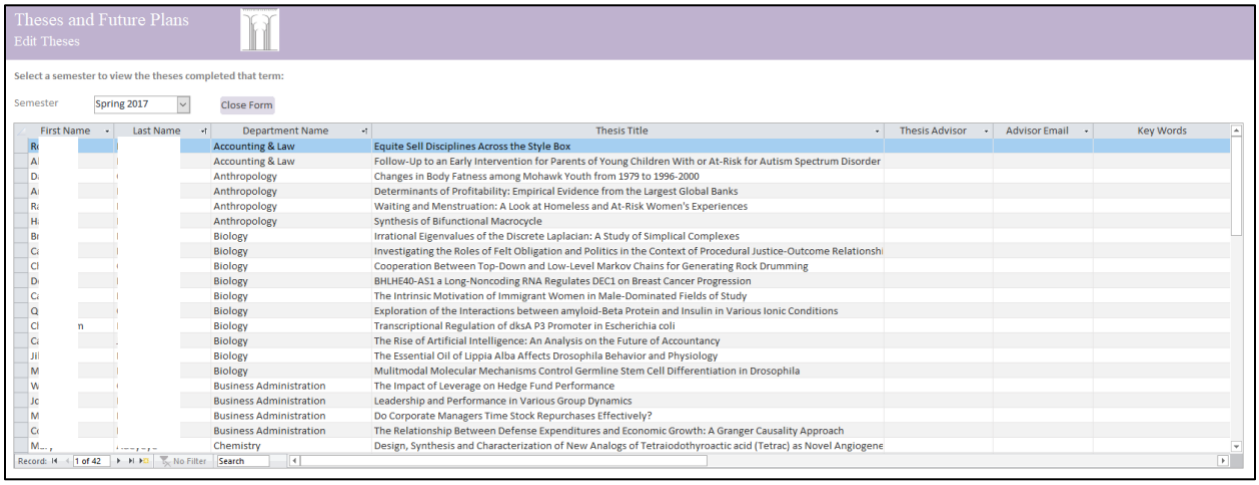


Figure 70. View Theses by Department Query

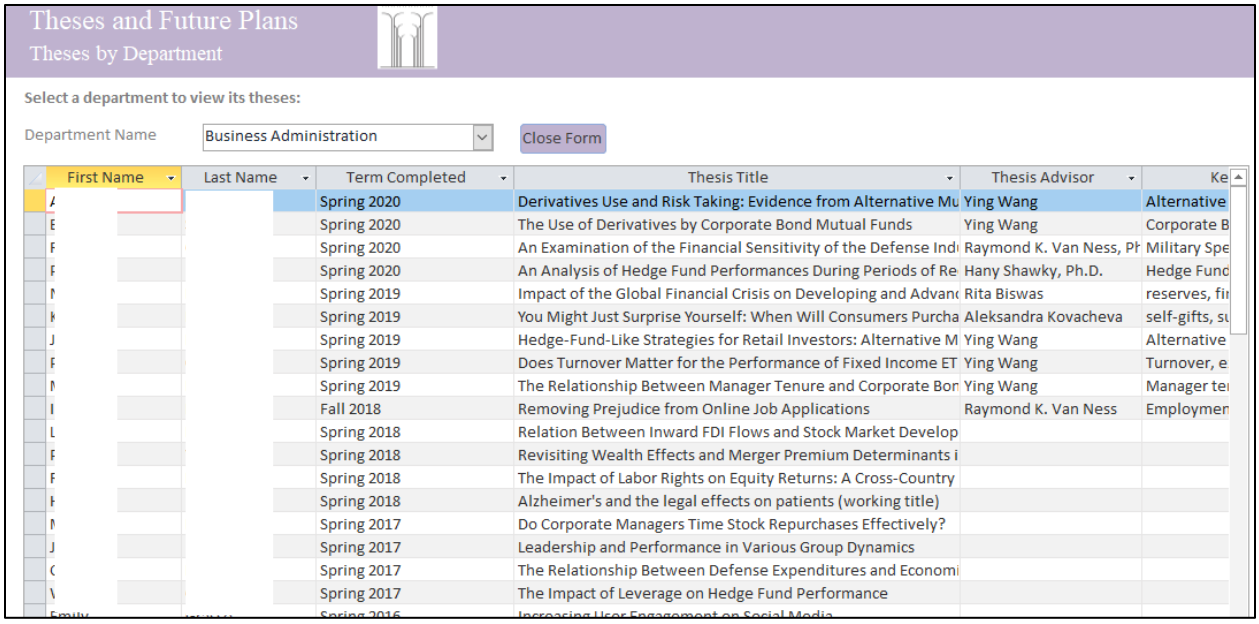


Figure 71. Add Future Plans Form

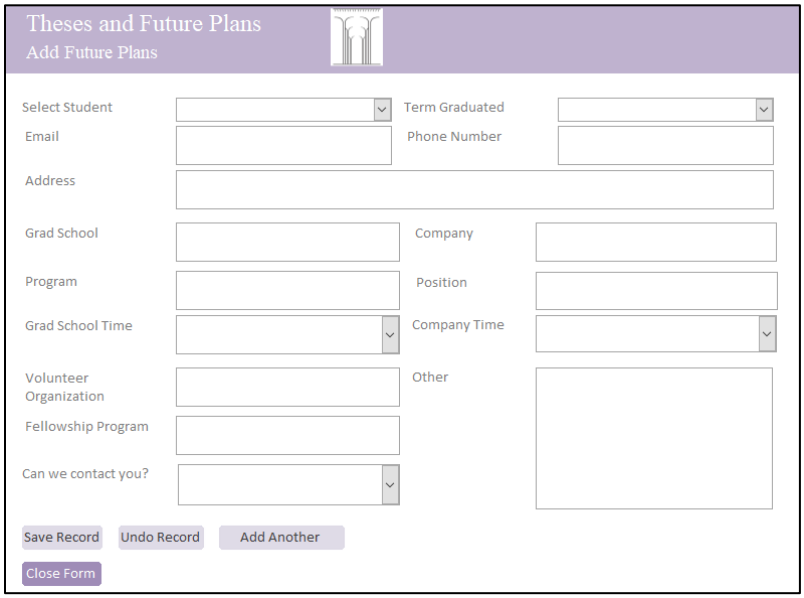


Figure 72. Edit Future Plans by Semester Query

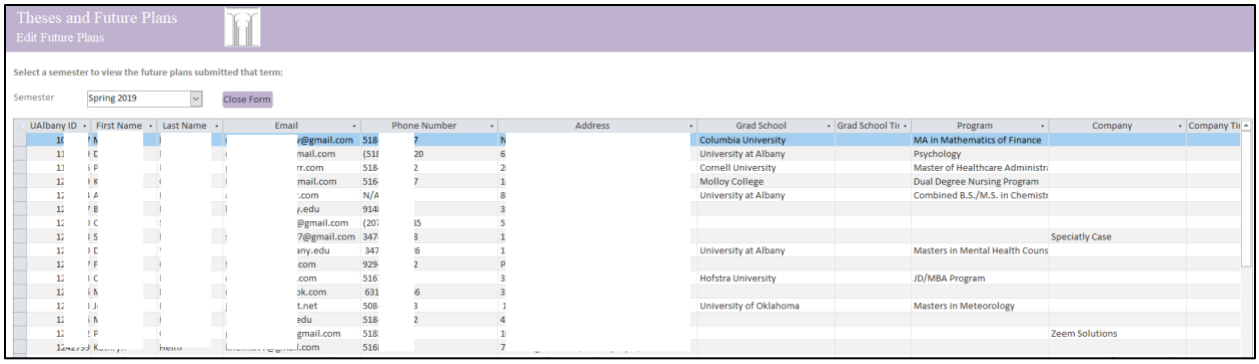
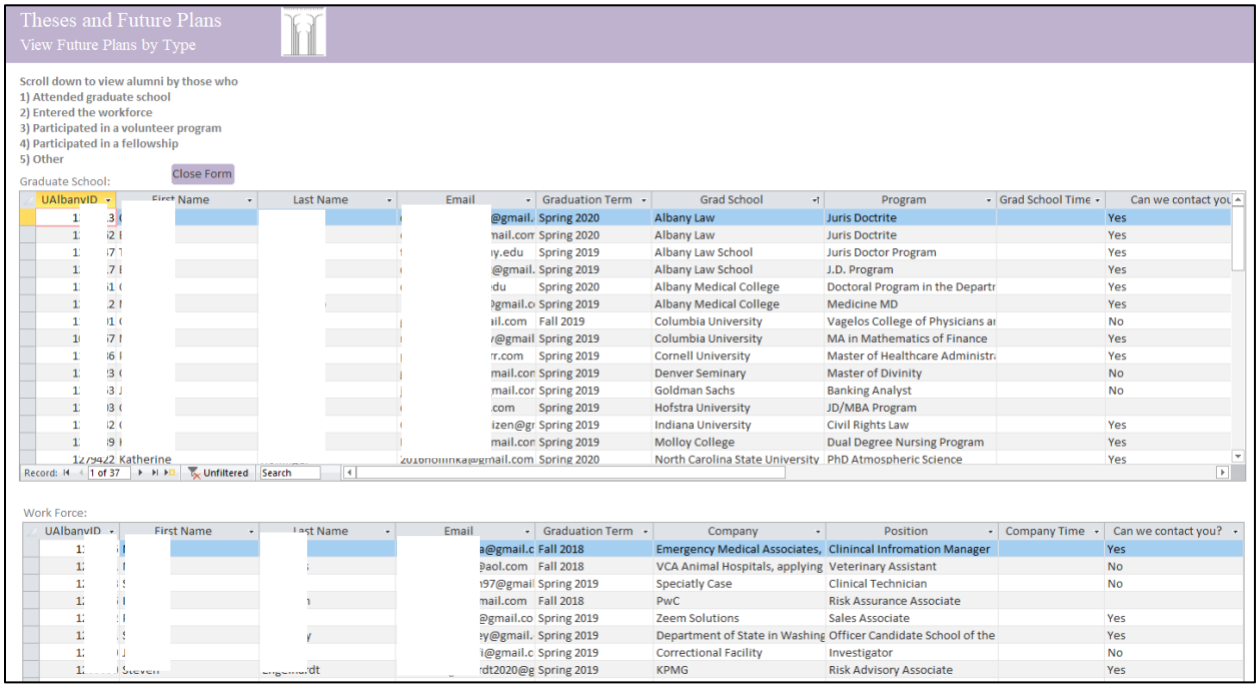


Figure 73. View Future Plans by Type Query



A.2.7 Event Attendance Subsystem

Figure 74. Event Attendance Landing Page

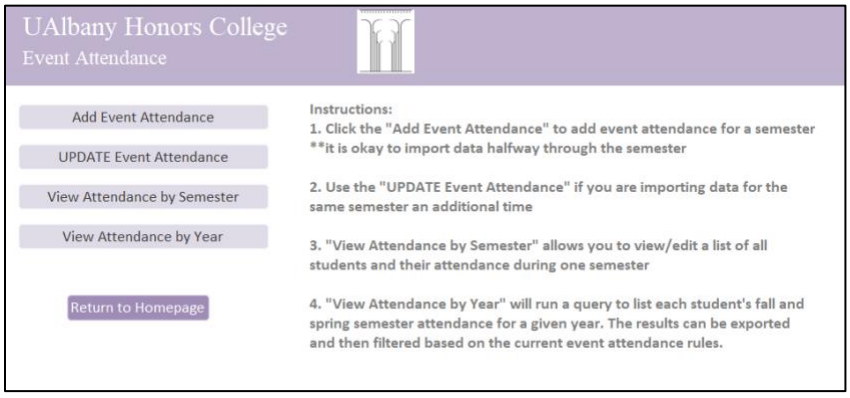


Figure 75. View Attendance by Semester Query

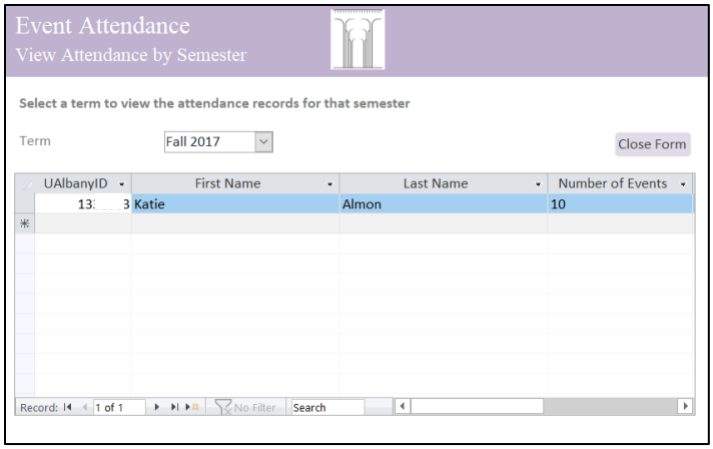
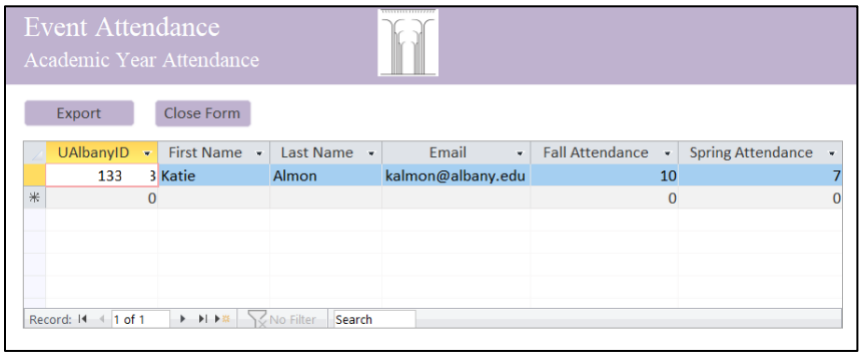


Figure 76. View Attendance by Year Query



A.2.8 System Updates Subsystem

Figure 77. System Updates Landing Page

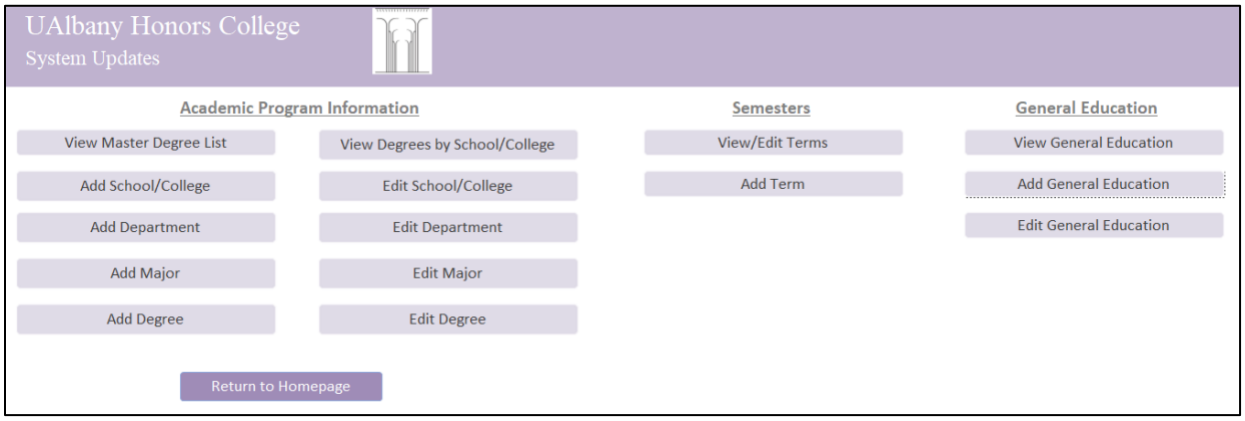
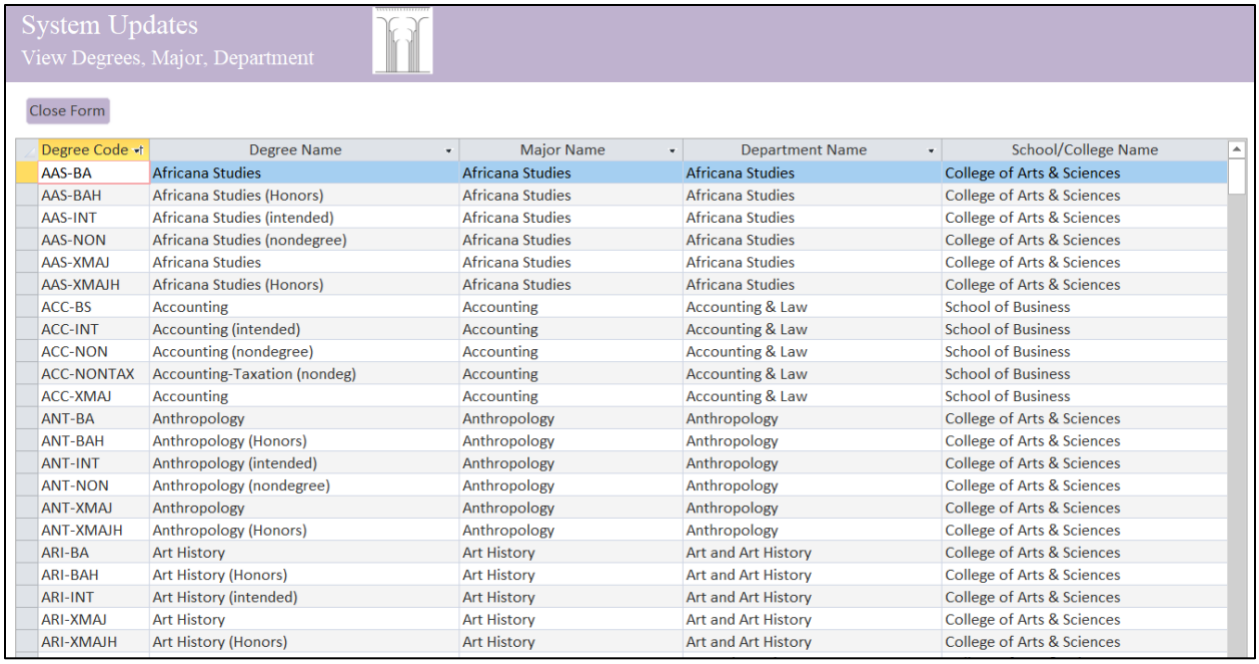


Figure 78. View Master Degree List Form



Degree Code	Degree Name	Major Name	Department Name	School/College Name
AAS-BA	Africana Studies	Africana Studies	Africana Studies	College of Arts & Sciences
AAS-BAH	Africana Studies (Honors)	Africana Studies	Africana Studies	College of Arts & Sciences
AAS-INT	Africana Studies (intended)	Africana Studies	Africana Studies	College of Arts & Sciences
AAS-NON	Africana Studies (nondegree)	Africana Studies	Africana Studies	College of Arts & Sciences
AAS-XMAJ	Africana Studies	Africana Studies	Africana Studies	College of Arts & Sciences
AAS-XMAJH	Africana Studies (Honors)	Africana Studies	Africana Studies	College of Arts & Sciences
ACC-BS	Accounting	Accounting	Accounting & Law	School of Business
ACC-INT	Accounting (intended)	Accounting	Accounting & Law	School of Business
ACC-NON	Accounting (nondegree)	Accounting	Accounting & Law	School of Business
ACC-NONTAX	Accounting-Taxation (nondeg)	Accounting	Accounting & Law	School of Business
ACC-XMAJ	Accounting	Accounting	Accounting & Law	School of Business
ANT-BA	Anthropology	Anthropology	Anthropology	College of Arts & Sciences
ANT-BAH	Anthropology (Honors)	Anthropology	Anthropology	College of Arts & Sciences
ANT-INT	Anthropology (intended)	Anthropology	Anthropology	College of Arts & Sciences
ANT-NON	Anthropology (nondegree)	Anthropology	Anthropology	College of Arts & Sciences
ANT-XMAJ	Anthropology	Anthropology	Anthropology	College of Arts & Sciences
ANT-XMAJH	Anthropology (Honors)	Anthropology	Anthropology	College of Arts & Sciences
ARI-BA	Art History	Art History	Art and Art History	College of Arts & Sciences
ARI-BAH	Art History (Honors)	Art History	Art and Art History	College of Arts & Sciences
ARI-INT	Art History (intended)	Art History	Art and Art History	College of Arts & Sciences
ARI-XMAJ	Art History	Art History	Art and Art History	College of Arts & Sciences
ARI-XMAJH	Art History (Honors)	Art History	Art and Art History	College of Arts & Sciences

Figure 79. Add School/College Form

Figure 80. Add Department Form

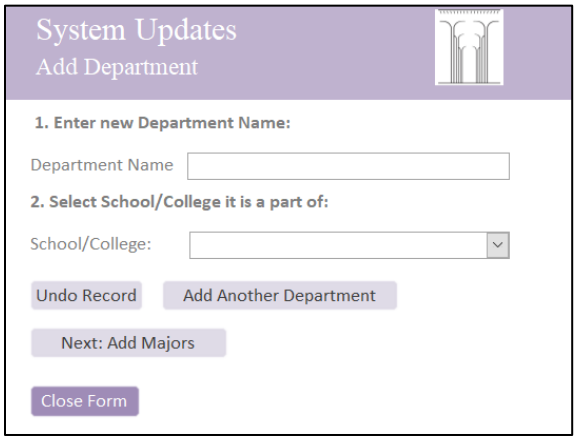


Figure 81. Add Major Form

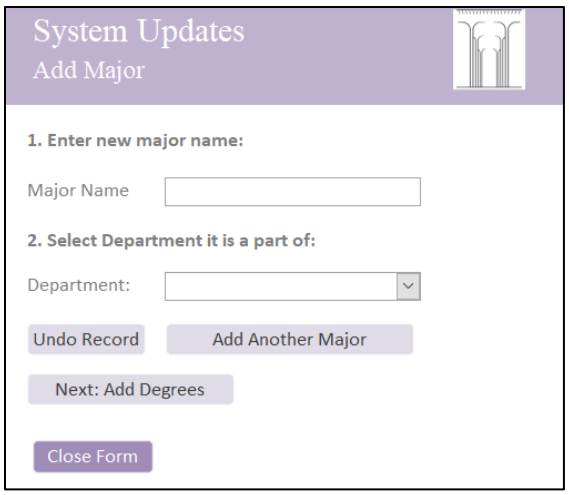


Figure 82. Add Degree Form

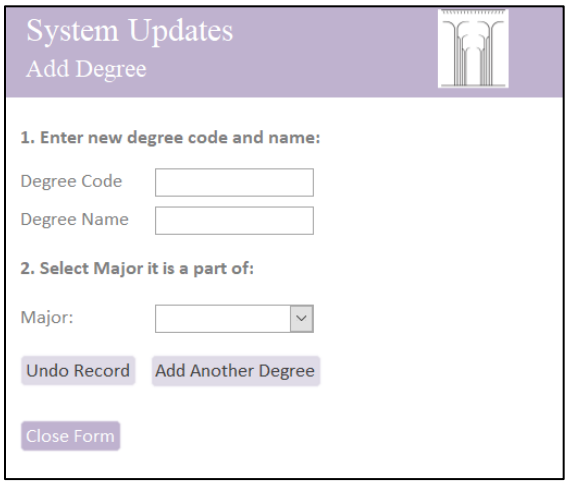


Figure 83. View Degrees by School/College Query

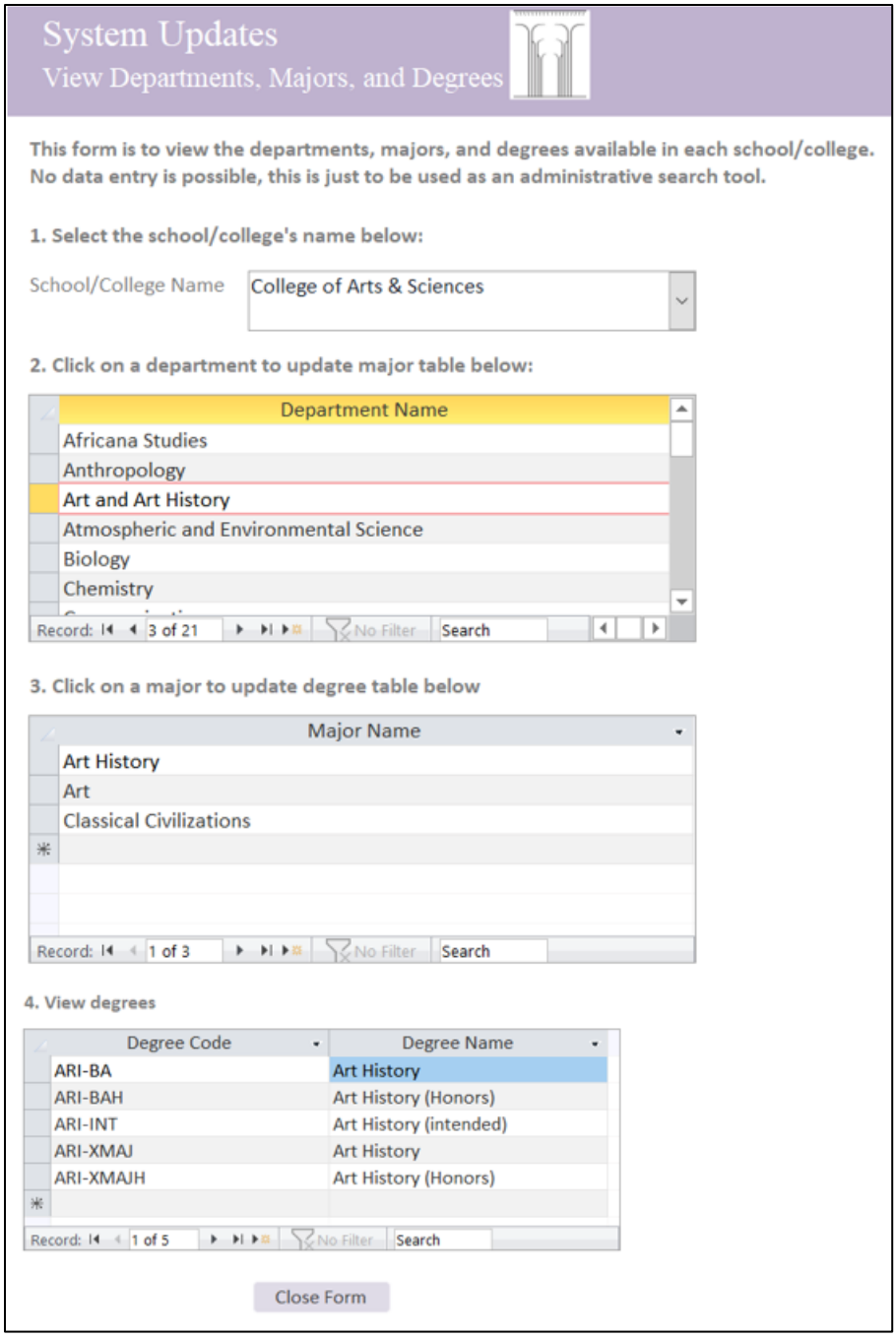


Figure 84. Edit School/College Form

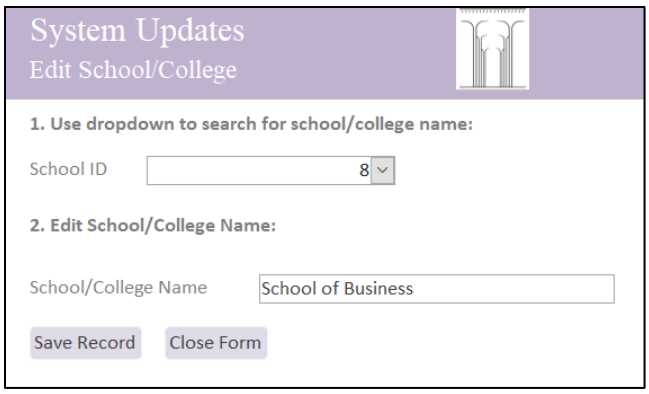


Figure 85. Edit Department Form

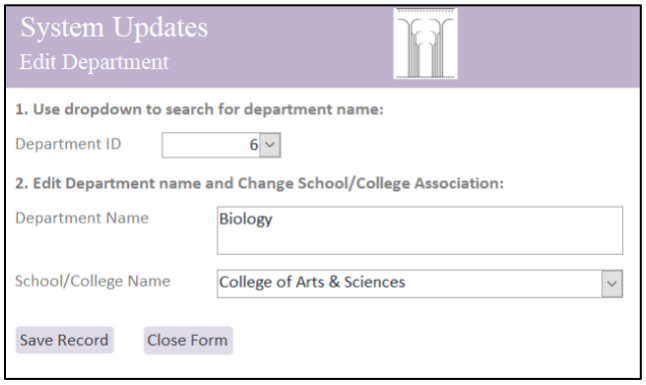


Figure 86. Edit Major Form

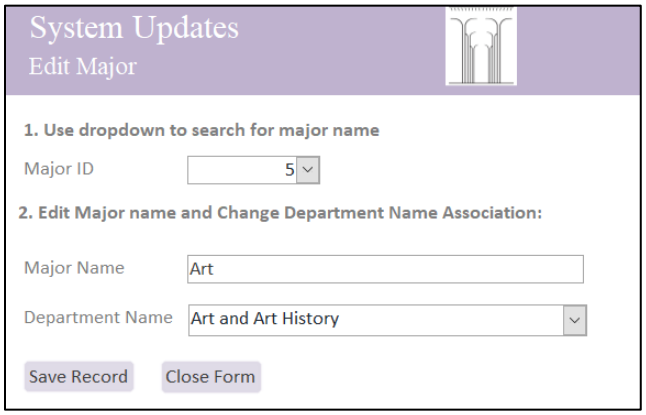


Figure 87. Edit Degree Form

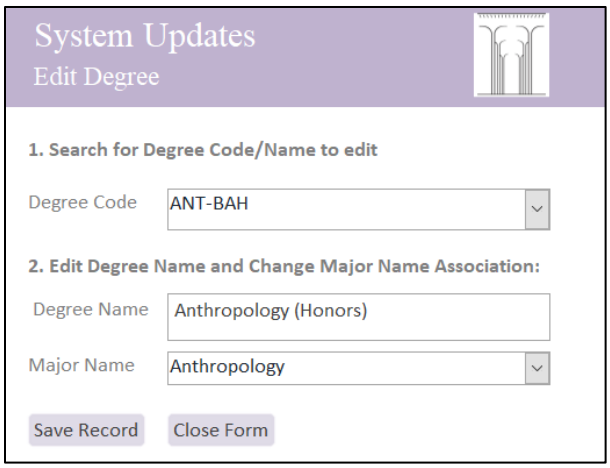


Figure 88. View/Edit Term Form

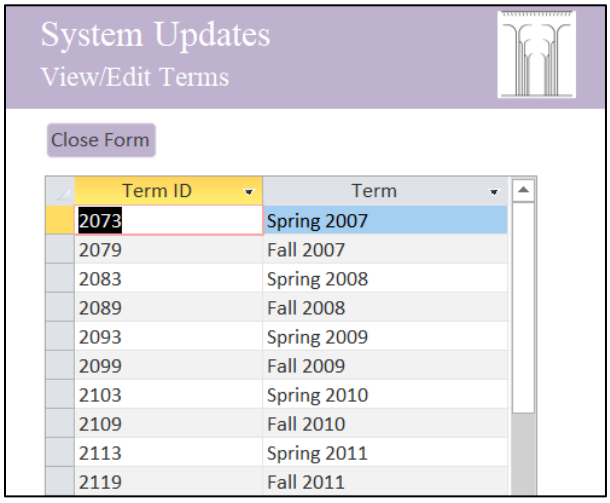


Figure 89. Add Term Form

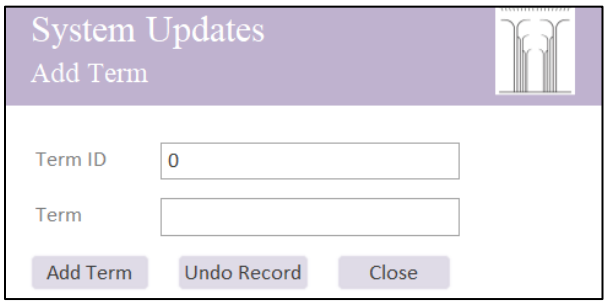


Figure 90. View General Education Form

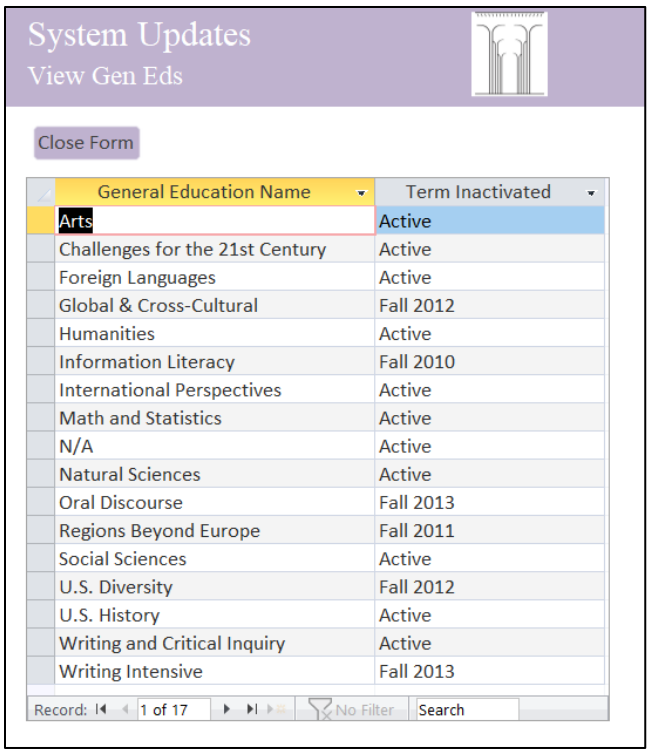


Figure 91. Add General Education Form

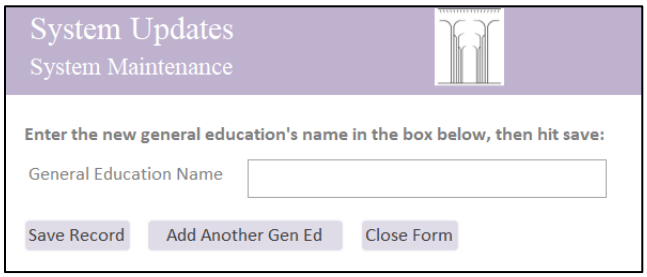


Figure 92. Edit General Education Form