

**Revised: August 10, 2022**

**Improvements Driven by Assurance of Learning**

**By Program**

**Academic Year 2021/2022**

Table of Contents

|  |  |  |
| --- | --- | --- |
| **Sr. No.** | **Course** | **Page No.** |
| 1 | BS in Business – Significant Changes Related to AoL Assessment Process | 2 |
| 2 | Quantitative Finance (QF) – Significant Changes Related to AoL Assessment Process | 7 |
| 3 | MS in Business Intelligence and Analytics – Significant Changes Related to AoL Assessment Process | 8 |
| 4 | Enterprise Project Management (EPM) – Significant Changes Related to AoL Assessment Process | 9 |
| 5 | Master of Business Administration (MBA) | 12 |
| 6 | Master of Science in Information Systems (MSIS) – Significant Changes Related to AoL Assessment Process | 15 |
| 7 | MS Management (MSM) – Significant Changes Related to AoL Assessment Process | 17 |
| 8 | MS Technology Management (MSTM/EMBA) – Significant Changes Related to AoL Assessment Process | 19 |
| 9 | MS Finance (MFIN) – Significant Changes Related to AoL Assessment Process | 21 |
| 10 | MS Financial Engineering (FE) – Significant Changes Related to AoL Assessment Process | 22 |
| 11 | MS Financial Analytics (FA) – Significant Changes Related to AoL Assessment Process | 22 |
| 12 | Doctor of Philosophy Programs – Significant Changes Related to AoL Assessment Process | 24 |

# BS in Business – Significant Changes Related to AoL Assessment Process

**Bachelor of Science in Business**

**Top Significant changes made to this program driven by Assurance of Learning. Also includes structural changes influenced by input from advisory board, alumni, market need, etc.**

1. **INTRODUCTION AND OVERVIEW OF BS BUSINESS DEGREE**

The BS Business program includes the following majors: Business & Technology, Finance, Management, Marketing Innovation & Analytics, Information Systems, Economics and following feedback from industry and faculty an Accounting and Analytics major was the latest major added, then a**n Accounting minor was approved as well.** After receiving feedback from faculty, students and the BOD**,** the **Marketing major was rebranded as Marketing Innovation & Analytics** to continue to reflect a change in curriculum completed.

Students in all majors share the same core curriculum, which includes the Liberal Arts and Science Core, Business Core, and Practice Core. The BS Business program started in academic year 2013-2014, and it took the place of BS Business & Technology that has been running since Fall 2000.  The reason for the change is that under BS Business & Technology there was only one major – the Business & Technology major. **Starting fall 2016, seven majors exist that reflect well the degree of Bachelor of Science in Business.**

Since 2007, under the BS Business & Technology degree, the program followed strong assurance of learning processes that are being continued with the BS Business degree.  The goals of the program have been assessed **7-9** times depending on the goal. **Following the AOL accreditation committee’s recommendation in 2015**, to simplify the assessment process, we have begun to successfully **automate the team assessment goal (goal 2)**, and now also focus on assessing three AOL goals. More detailed results from goal assessments and corresponding steps taken to address those specific goals are documented in the individual goal booklets.  **Below we have summarized more noteworthy changes** that have resulted from the AOL assessment feedback. These significant changes were also informed by other forms of feedback outside of Assessment of Learning, including student interviews and course reviews, benchmarking our programs relative to other universities, and an in-depth review of the program conducted by faculty.

**CURRICULUM CHANGES – Influenced by AOL**

|  |  |
| --- | --- |
|  | 1. Drawing on, for example, AOL goal 3 trait “The student demonstrates creative and innovative thinking” and other feedback from students, faculty and benchmarking other universities, we **continued, since-2018, to effectively roll out** various courses in the **Bachelor of Science in Business** including: 1) **Decision making and 2) Creativity and Innovation**. The courses, e.g., Decision Making, also support other AOL learning objectives, including AOL learning **goal 1 oral communication** (e.g., students present case studies) and AOL learning **goal 2 effective** **teamwork** (e.g., students collaborate and lead teams).  |
|  |  |

|  |
| --- |
| 2. Based on goal 3 (leveraging technology for business success) and other feedback from students, faculty and benchmarking other institutions, students in the Bachelor of Science in Business in the, e.g., Economics major, **are at present taking supplementary technology-oriented courses**, including **Econometrics** which enables to quantify theoretical models; and in the Finance major, in **2021-2022** **FIN420 “A Survey of Topics in Financial Technology was approved by the UCC.**  |
|  |

|  |
| --- |
| 3. The Bachelor of Science in Business Program continues to invest **countless effort** to address the **importance of Business Ethics**, which is implicitly **tackled across countless classes**. All students in the BS in Business are continuing to take an ethics Module. |

|  |  |
| --- | --- |
|  | **4. Based on goal 3** (leveraging technology for business success) and other feedback, students in the **Business & Technology major** can currently **take a wider range of business classes** in the Business and technology concentration. In the business concentration, **since 2019** students have been provided with **superior selection**, and specialties now include, Finance, Management**, Marketing Innovation & Analytics**, Information Systems, Economics, as well as **Accounting and Analytics**. We, **since that time, completed the roll out of all courses related to the new majors** in Finance, Marketing, Information Systems, Economics and Management, and have finalized the Accounting and Analytics 5th year curriculum.Additional courses were approved including, **Intermediate Accounting I and II** as well as the **Accounting minor**. Further, Syllabi for **two tax courses** were approved by the UCC: **Federal Taxation of Business Entities and Federal Taxation of Individuals. A course on Auditing was approved by the UCC and implemented starting 2019-2020.****The technology concentrations includes** IS, Computer Science, Environmental Science, Biotechnology, Green Technology, Music & Technology, Arts & Technology, History & Philosophy of Technology and Science.**Prior to the expanded business concentrations**, students had a more constrained choice of coursework besides elective selections. The **extra concentrations in business,** combined with the technology concentrations, provide students more choice and ensure they are developing specialty capacity in both business and technology. In addition to goal 3, these changes are in line with the SOB Vision and Mission and program goals, which all emphasize the importance of being a business school with technology at our core. |
|  | 5. Based on goal 2 (effective team work) and other feedback, we persisted to **hone** **the “practice core”** courses that focus on team projects that challenge students to solve real-world problems that are cross-functional by nature. In numerous courses, students continue to center on performing strategic due diligence analyses and strategic planning for large public firms. In a different course, students discover how to identify market opportunities. Lastly, in two remaining courses students work on a project throughout their senior year in which they have the option to either be matched up with an actual company as their “client” or work on a start-up business. All projects have an underlying business problem that needs solving. Projects conclude with a group presentation as part of a campus-wide Innovation Day. Notably, in 2017, a comprehensive review of senior design for BSB was conducted, a plan was completed and reviewed by the UCC, and **its implementation has continued during 2021-2022**.  |
|  | 6. Based on goal 1 (oral and written communication) **evaluations** and other feedback, all students **carried on taking a freshman writing course during 2021-2022**, which has been improved and perfected by the College or Arts and Letters. This continues to provide BSB students with a strong basis they then work and cultivate during the course of the curriculum, and later on are assessed in senior year.

|  |
| --- |
| 7. Our goal 3 assessments (leveraging technology for business success) and other feedback, suggested that while students were getting exposure to business fundamentals, the opportunity for students to develop a **specialty** in a **particular business** **area was still not comprehensive enough**. This narrowed students’ ability to have ample business acumen in a particular business **field** so that they could have greater ability to leverage technology for business solutions. A **detailed ongoing review** was implemented, and it was **decided to gradually adjust the curriculum** **and expand our SOB’s offerings beyond Business & Technology, Finance, Management, Marketing Innovation &** **Analytics** **which has an expanded curriculum, Information Systems and Economics, to include Accounting & Analytics *as well as* an Accounting minor** (2018). **The latter newer major and the remaining majors all take the same core**, as well as 6-8 courses in their major. We also **persisted** to adjust the Business & Technology curriculum to reflect the additional majors that were added. In the new curriculum, students take the Business Core but **presently (2021-2022) also have an opportunity for a much wider selection** of business concentrations to specialize in, which include taking classes in one of seven business areas (Finance, **Management, Marketing Innovation** & Analytics, Information Systems, **Economics and Accounting & Analytics, along with the opportunity to minor in various domains, e.g., accounting).** |

 |
|  | **STRUCTURAL CHANGES – Influenced by advisory Board, Alumni, market needs, etc.**

|  |
| --- |
| 1. **Rebranding of Marketing to Marketing Innovation & Analytics to capture the curriculum changes in the marketing major in Spring 2019, based on AOL and other feedback**. Drawing on AOL **feedback**, and additional feedback from students, faculty and the **SOB BOD**, during Fall 2019, Marketing Innovation & Analytics majors will also be required to take new and existing courses in “Creativity and Innovation”. Additionally, all Marketing majors will be asked to take a marketing related senior design project. The new Marketing Innovation & Analytics curriculum completed in Spring 2019 includes a data analytics course as well. The current courses include: Marketing Analytics & Research; Marketing Strategy in a Digital World; Social Media and Network Analysis; Virtual and Physical Consumer Behavior; Integrated Marketing Communications; and Data Analytics. |

|  |
| --- |
| 2. **Drawing on faculty and student feedback, freshman entering Fall 2022 will continue to have a re-sequenced course schedule.** For example, B.S. in Business, Major: Business & Technology students will take BT 100 in the freshman year, and BT 330 in their junior year; and Financial accounting and corporate finance in term 2 and 3.  |

 |

|  |
| --- |
| 3. **Drawing on AOL, faculty, student and external feedback, including benchmarking, a course on Auditing** has continued to be incorporated successfully in **2021 - 2022**. Auditing is one of the specific areas required to sit for the CPA exam. The course addresses auditing and assurance services with a focus on the audit of financial statements, and the role of these services in business and society and their ethical environment. The course provides knowledge in areas such as, the auditor’s and management’s responsibilities in the conduct of an audit, the practical application of audit procedures, and develops expertise financial reporting in the audit of financial statements.  |

4. **Drawing on AOL, faculty, student and benchmarking, the IS undergraduate offerings** were **redesigned** in 2021- 2022, for example, to include a tech concentration.

5. **Drawing on AOL, faculty, student and external feedback on the value of technology in finance**, in 2021- 2022 the UCC committee approved **FIN420 “A Survey of Topics in Financial Technology** “to be used as an elective for the Finance Major/Minor/ Concentration for BSB/ Concentration for QF, as well as for the QF minor and as an elective for the QF major. It can also be used as a general elective.

 6. **Drawing on AOL, faculty, student and external feedback, in 2021-2022** the UCC approved the addition of the **new accounting course - ACC 545** Accounting Data Analytics to be added to the list of courses applicable for the accounting minor and the accounting concentration.

7. **Drawing on AOL, economics faculty, and benchmarking feedback, in 2021-2022** the UCC approved new syllabi for **smaller class recitation** sections in B100; BT 350; and BT 353 to increase student understanding and engagement.

**WHAT COMPETENCIES WERE MET AND WHAT CHANGES WERE MADE BECAUSE OF DIRECT AND INDIRECT MEASURES**

**Specific competencies**: There are **specific competencies** that are needed in teamwork that AOL goal 2 addressed in both BT 330 and QF. The competencies that are targeted are task management skills, and relationship management skills. **Task management** skills include: clarifying roles and responsibilities of others; suggesting new approaches to solving problems; defining task priorities for work sessions and or projects. **Relationship management** skills include: working towards solutions and compromises that are acceptable to all involved; reinforcing the contributions of others; encouraging ideas and opinions even when they differ from his/her own.

**Indirect measures**: Interviews with team members / exit surveys was conducted at the end of junior year. The interview is structured, with representative team members in BT 330 and QF. The structured interview gathers information about the key specific competencies described above. The responses will be subjected to a content analysis to identify underlying themes.

**Direct measure:** Students work in teams throughout the semester. Team members complete a team assessment of their peers similar to a 360-degree evaluation to assess AOL Goal 2, effective interaction in teams. In both BT 330 and QF classes, the direct assessment, which is reliable and valid, is completed through a survey monkey tool. A teaching assistant imports the data into an excel file and creates an average for each team and members on key teamwork behaviors. The courses rely on teams to complete collaborative assignments, so understanding effective interaction in teams is a key to the team’s success. One key goal here is to help the student understand how they can contribute to the team in terms of ***facilitating task accomplishment* (*team leadership*) and *facilitating relationship building* (team facilitation),** which the direct teamwork assessment captures. The feedback from the assessment enables the students to understand what behaviors they can develop to become more effective team members.

**What competencies were met:**

1. **The indirect measure: Interviews / exit surveys with representative team members.**

|  |  |
| --- | --- |
| Objective 1 | **Task management** skills  |
| Key underlying themes observed | **Competency features met**: suggesting new approaches to solving problems; defining task priorities**Competency features not met:**The interviewees for the teams felt that each team should clarify better roles and responsibilities for individual members on the team prior to each weekly collaborative assignment.  |
| Objective 2 | **Relationship management** skills  |
| Key underlying themes observed | **Competency features met**: reinforcing the contributions of others; **Competency features not met**:The interviewees for the teams felt that each team should improve on working towards solutions and compromises that are acceptable to all involved. |
|  **Changes:** Corrective action  | Following the underlying themes identified from interviewee responses, the students will be advised to review the behavioral guidelines for *task management and relationship managing skills* to enhance these behaviors (Robbins and Judge, Organizational Behavior, 18th Edition) at the beginning of Fall 2022. The material will be provided as a pdf for class participants. |

1. **The direct measure: Team members complete a team assessment of their peers similar to a 360-degree evaluation to assess AOL Goal 2, effective interaction in teams**

|  |  |
| --- | --- |
| Objective 1 | *Students will be able to facilitate task accomplishment (team leadership) within the context of project teams* |
| Objective 2 | *Students will be able to facilitate relationship building (team facilitation) within the context of project teams* |
| Comments:  | On the First Objective and the Second objective the students either met or exceeded expectations. |
| Changes made because of direct measurements: | While from the findings it seems the majority of students met or exceeded expectations on both learning objectives, the students will be advised to review the behavioral guidelines for *facilitating-task accomplishment and facilitating-relationship building behavior* so as to boost these behaviors (Whetten and Cameron, 2020) at the beginning of Fall 2022. The material will be provided as a pdf for the students. |

# Quantitative Finance (QF) - Significant Changes Related to AoL Assessment Process

**Bachelor of Science in Quantitative Finance**

**Top Significant changes made to this program driven by Assurance of Learning. Also includes structural changes influenced by input from advisory board, alumni, market need, etc.**

**INTRODUCTION AND OVERVIEW OF BS in Quantitative Finance**

The Stevens QF program has been designed to provide students with a thorough and rigorous foundation in this multi-disciplinary field. Students will be selected for strong quantitative aptitude, high motivation and work ethic, and a strong interest in the field of Computer Science, Business and Finance. Over the course of eight semester terms, through approximately 135 credit-hours of course work, students may choose to follow one out of main “threads” in the QF curriculum: Accounting, Quantitative Methods, Computer Science, and Finance & Economics.

The program started with 4 goals, but has moved to 3 in order to streamline the assessment process. The first two goals are those shared by all programs in the school of Business, and the third goal has our students develop financial models and technical systems in order to have a broad understanding of financial systems.

**CURRICULUM CHANGES - Influenced by AOL**

|  |  |
| --- | --- |
| **1** | Moved assessment of Goal 1 to QF 101/102 to allow earlier feedback for improvement |
| **2** | The revamping and strengthening of the “statistics thread” in the program, |
| **3** |  The strengthening of the introductory CS courses by taking them into our teaching framework |

 **STRUCTURAL CHANGES – Influenced by Advisory Board, Alumni, market needs, etc.**

|  |  |
| --- | --- |
| 1 | The preparation of new Fintech-oriented courses — e.g., the Fintech survey course |
| 2 | The creation of an Accounting & Analytics concentration in QF |
| 3 | The continued strengthening of the SMIF course, QF 427/428 — which now manages around $700,000 of the endowment directly |
| 4 | The expansion and upgrade of the Hanlon Center support for QF program needs, including the upgrade of the QF 103 and QF 104 (Bloomberg and related data sets, and R programming respectively) |

# MS in Business Intelligence and Analytics (BIA) – Significant Changes Related to AoL Assessment Process

**Masters of Science in Business Intelligence and Analytics (BI&A)**

**Top Significant changes made to this program driven by Assurance of Learning. Also includes structural changes influenced by input from advisory board, alumni, market need, etc.**

**INTRODUCTION AND OVERVIEW OF MS in BIA**

# CURRICULUM CHANGES - Influenced by AOL

|  |  |
| --- | --- |
| **1** | **Implementation of Experiential Learning in Required Data Management Course**. Based on a number of years of feedback (for example measurements in MIS Learning Goal 4) most students had a poor understanding of database design principles and basic SQL querying skills. In 2021-22 the 3-credit MIS 630 Data Management course was split into MIS 631 Data Management (2-credit lecture) and MIS 632 (1 credit lab section). The MIS 632 Lab sections follow immediately after the their associated MIS 631 section, are taught by a separate instructor, and provide an opportunity for students to practice what they learned in the .lecture section. Feedback from students, faculty supported by a significant improvement in the performance of students in the MIS Goal 4, indicate that this intervention has been very successful. |
| **2** | **Implementation of Experiential Learning in Required Business Intelligence & Data Integration course.** Similarly, in 2021-22, we also split the 3-credit MIS 636 Data Warehousing course into MIS 633 Business Intelligence & Analytics & Data Integration (2-credit lecture) and MIS 634 (1 credit lab section). Again, the MIS 634 Lab sections follow immediately after the associated MIS 631 section, are taught by a separate instructor, and provide an opportunity for students to practice what they learned in the lecture section. Feedback from students and faculty indicate that this intervention has been very successful. These skills are measured in learning goal *BIA-4: Students can find and deploy business solutions based on analyses of large and heterogeneous data sets*. |
| **3** | **Restructuring of the BI&A Online Program.** To better compete in the emerging world of online the university engaged Stevens Institute of Technology hired Noodle, an online technology-based educational company (see [www.Nooodle.com](http://www.Nooodle.com)) to help faculty develop courses that employ that latest learning technologies and advance learning strategies such as“inverting the classroom” and experiential learning. The BI&A program is part of this initiative. This is a major undertaking. Each of the 12 designated courses required in the online master’s degree is redesigned by faculty, with guidance from Noodle experts over a 6-month period. Once developed, students are required to learn the material before they attend class and the online class sessions are reduced to 2 hours of discussion guided by the instructor. So far, we have implemented and taught 6 of the 12 required courses in the online curriculum. Feedback from the faculty who have developed these courses and the students who have taken them is very constructive. In this sense, we believe we are preparing appropriately to compete in the future highly competitive world of online learning, which has many traditional and non-traditional players. |
| **4** | **AI and Big Data.** For several years, the BI&A Program has been developing its strength in these two areas. Specifically, two years ago we developed 4-course certificate programs in The Management of AI and Big Data, respectively.The recent report by the Information Systems task group of the AACSB and Price-Waterhouse sponsored MaCudeemphasizes the importance of these two areas for the future of business education. |

**STRUCTURAL CHANGES – Influenced by advisory Board, Alumni, market needs, etc.**

Based on discussions with the BI&A Industry Advisory Board and our own sense of trends in industry, we made several structural changes to the BI&A curriculum in 2021-22 including:

1. Changed the core curriculum from 8 courses to 9 required courses by adding BIA 654 Experimental Design (formerly an elective course) into the core as a sequel to the required BIA 652 Multivariate Analytics course. . This means that that all students take two statistics courses to better prepare them for a new world of analytics the is increasingly dominate by machine learning (ML) and artificial intelligence (AI).
2. Introduced three 3-course concentrations that reflect the three different career trajectories of our graduating students as follows:
	1. Data Analytics– for business analysts and data analysts
	2. Data Science & AI – for data scientists
	3. Big Data – for data engineers

**WHAT COMPETENCIES WERE MET AND WHAT CHANGES WERE MADE BECAUSE OF DIRECT MEASUREMENTS AND IN-DIRECT MEASUREMENTS**

* Analytical skills – an additional statistics course (BIA 654 Experimental Design) was added to the core
* Data management skills – labs were introduced into the two required data-orientd courses as described above.
* General knowledge of business analytics skills – the BI&A program runs a weeel seminar series featuring industry and faculty spekers in the fall, spring and summer semesters
* Communication and team skills – continue to be evaluated via BI&A Learning goals 1 and 2, respectively

# Enterprise Project Management (EPM) – Significant Changes Related to AoL Assessment Process

**Masters of Science in Project Management (EPM)**

**Top Significant changes made to this program driven by Assurance of Learning. Also includes structural changes influenced by input from advisory board, alumni, market need, etc.**

**INTRODUCTION AND OVERVIEW OF EPM PROGRAM**

The 30-credit Stevens master's degree in Enterprise Project Management emphasizes a strategic perspective that’s crucial to modern project management. This is a program for the technical professional eager to advance in the organization by directing people, budgets and projects toward completion. Curricular themes in strategic perspectives, project planning and cross-project leadership ensure graduates can direct complex, enterprise-level initiatives. Classes include significant analytical components that will challenge students to think quantitatively about challenges in management. This program is [accredited by the Project Management Institute](https://www.stevens.edu/about-stevens/accreditation#pmi_accreditation), the leading organization in project management. Classes taken through Stevens can be applied to Project Management Professional certification or certification maintenance.

Program goals, as related to Assurance of Learning:

1. Students can communicate effectively in written and oral presentations.
2. Students can interact effectively in teams.
3. Students can develop a plan that shows how an enterprise project creates value for its stakeholders.
4. Students understand how to influence and lead enterprise projects.

# CURRICULUM CHANGES - Influenced by AOL

|  |  |
| --- | --- |
| **1** | We added the use of "Boosted Learning" initiative (weekly emails of multiple-choice questions) to promote in-class interaction AND post-semester student engagement. (MGT 609)  |
| **2** | **In support of Goals 3 and 4**, we added real-life project cases from the files of WebCampus - including the implementation of current eLearning technologies. (MGT 609) |
| **3** | **In support of Goals 4**, we utilized new project management game to teach project monitoring and control. The goal is to improve practical experiences, based on student feedback. (MGT 609) |
| **4** | **In support of Goals 1 and 2**, we added in-class working sessions for team presentations. This allowed instructor coaching on each group’s content and delivery. (MGT 612) |
| **5** | **In support of Goal 4**, we added more structure to leadership role plays so this exercise can be implemented more efficiently via Zoom. (MGT 612 WS) |
| **6** | Case studies and other course content was contemporized. (MGT 610, 611, 613) |
| **7** | Temporarily removed course from the program curriculum due to many of the topics being taught in the refurbishment of other EPM courses. This change was motivated by student feedback. (MGT 614) |

#  STRUCTURAL CHANGES – Influenced by Advisory Board, Alumni, market needs, etc.

|  |  |
| --- | --- |
| 1 | Graduate Management Program implemented a new mentorship program. This program matches students with a professional mentor in their industry of interest. The mentorship program aims to help students become more familiar with their industry of interest and broaden their understanding of the professional opportunities available. Via monthly meetings, mentors are expected to guide students through the job search process and advise best practices to position themselves and articulate their value to future employers.  |
| 2 | **In support of Goal 1**, Established a closer relationship with PMI (NJ chapter) via the use of industry coaches for case feedback and in-class presentations.  |

**WHAT COMPETENCIES WERE MET AND WHAT CHANGES WERE MADE BECAUSE OF DIRECT AND INDIRECT MEASURES**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Goal | Competencies | Direct Measure | Indirect Measure | Outcome |
| EPM – 1. Students can communicate effectively in written and oral presentations. | Written communication competencies include: logic flow and organization, grammar & sentence structure, syntax, idea development.Verbal communication competencies include: clear articulation of ideas, presentation capability and confidence, appropriate use of visual aides, transitions, time management, and ability to engage the audience. | Each student in *MGT 609 Project Management* produced two copies of a 4-page essay that was specified by the instructor and used also as part of the normal course requirements. | Self-Assessment of skills development  | **Written Communication**:The vast majority of students met or exceeded expectations. Compared to previous years, there was a slight increase to the writer’s overall ability to convey their ideas in an orderly, logical way.Writers are strongly encouraged to seek assistance from the Writing & Communication Center on campus to refine and improve their proofreading abilities. Faculty are encouraged to allow students extra class time to submit their documents for peer review. Wherever possible, instructors should give out samples of documents (both academic and professional) to model professional-level writing for all students.**Verbal Communication**: Students easily met or exceeded expectations.Faculty should give the students more opportunity to speak in front of the class, to gain experience and confidence. Faculty should also consider giving out style templates with minimum text size, recommended fonts, and examples of clear, uncluttered layouts. Faculty should take more care in creating their own PowerPoint decks and be sure they are modeling best practices. Students can also be encouraged to visit the Writing & Communication Center for extra help developing slides and practicing their oral delivery |
| EPM – 2. Students can interact effectively in teams.  | Task Management Relationship Management skills | The students were assessed at the end of the semester, for effective team interaction using self and peer evaluations, similar to a 360 degree feedback.  | Interviews with representative team members about the students’ teamwork competencies. | **Task & Relationship Management**:The majority of students met or exceeded expectations via assessment.Although, a content analysis of the interviews revealed that the students illustrate Relationship Management competencies to a greater extent, and can improve on engagement in Task management skills.Those who did not meet expectations will be advised to review the behavioral guidelines for facilitating-task accomplishment (Whetten & Cameron – Developing of Managerial Skills, 2020) at the beginning of Spring 2023. The material will be provided as a pdf for the students. |
| EPM – 3. Students can develop a plan that shows how an enterprise project creates value for its stakeholders. |  | After students have taken PM courses they will be contacted in different time intervals to respond to multiple choice questions.  | Professional certifications during study period (PMP or CAPM), contributions to professional societies, exit surveys, advisory board feedback | 56% of students meet or exceed expectations.This competency is not fully met. We just started with collecting data differently and it is too early to draw conclusions.  |
| EPM – 4. Students understand how to influence and lead enterprise projects. | Leadership  | Students in MGT 612 were assessed on the extent they understand how to influence and lead enterprise projects by the professor. |  | The students met or exceeded expectations. |

# Master of Business Administration (MBA)

**Masters of Science in Business Administration (MBA)**

**Top Significant changes made to this program driven by Assurance of Learning. Also includes structural changes influenced by input from advisory board, alumni, market need, etc.**

**INTRODUCTION AND OVERVIEW OF MBA**

This innovative 39-48 credit MBA prepares leaders to succeed by developing skills in technology and analytics. Our MBA courses feature applied exercises that prepare students to serve as leaders who are capable of making fast, data-supported decisions. MBA coursework emphasizes collaboration through group projects and presentations and develops student creativity and critical thinking skills through the incorporation of new analytical tools and the latest research insights.

Program goals, as related to Assurance of Learning:

1. Students can communicate effectively in written and oral presentations.
2. Students can interact effectively in teams.
3. Students will be able to develop and analyze descriptive, predictive, and prescriptive models using software tools to aid in decision-making.
4. Students will be able to effectively utilize analytic problem-solving skills.

Via a survey of continuing and graduating students, the majority of graduate management student respondents assessed a significant level of improvement in each of the skills and abilities mentioned above (compared to their skills prior to starting their program). Overall, they expressed valuing: assessments by instructor, utilization of simulations, and incorporation of other interactive and experiential exercises.

# CURRICULUM CHANGES - Influenced by AOL

|  |  |
| --- | --- |
| **1** | **In support of Goal 2**, we added in-class working sessions for team presentations. This allowed instructor coaching on each group’s content and delivery. (MGT 612) |
| **2** | **In support of Goal 1**, we added new course which introduces students to fundamental soft skills, work techniques and technologies employed by management consultants. The course is aimed to improve the student’s ability to present analyses of issues and organizational problems in a concise, accurate, clear and interesting manner from the perspective of a consultant. (MGT 808) |
| **3** | Case study content was contemporized in the following courses: MGT 506 and MGT 612. |
| **4** | **In support of Goals 2 and 4,** we incorporated a group simulation exercise which exposed students to real-time decision-making. This helped students practice collaboration and strategic thinking. (MGT 699) |

#  STRUCTURAL CHANGES – Influenced by Advisory Board, Alumni, market needs, etc.

|  |  |
| --- | --- |
| 1 | Graduate Management Program implemented a new mentorship program. This program matches students with a professional mentor in their industry of interest. The mentorship program aims to help students become more familiar with their industry of interest and broaden their understanding of the professional opportunities available. Via monthly meetings, mentors are expected to guide students through the job search process and advise best practices to position themselves and articulate their value to future employers.  |
| 2 | Proposed updates to full-time MBA/Analytics MBA program structure, offerings, and resources/support. This would help better serve the full-time student population, offering more opportunities to develop key skills, learn from industry professionals and other key players, and receive individualized career preparation and placement support. |

**WHAT COMPETENCIES WERE MET AND WHAT CHANGES WERE MADE BECAUSE OF DIRECT AND INDIRECT MEASURES**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Goal | Competencies | Direct Measure | Indirect Measure | Outcome |
| MBA – 1. Students can communicate effectively in written and oral presentations. | Written communication competencies include: logic flow and organization, grammar & sentence structure, syntax, idea development.Verbal communication competencies include: clear articulation of ideas, presentation capability and confidence, appropriate use of visual aides, transitions, time management, and ability to engage the audience. | Each student in *MGT 635 Managerial Judgment and Decision Making*  produced two copies of a 4-page essay that was specified by the instructor and used also as part of the normal course requirements. | Self-Assessment of skills development | **Written Communication**:The vast majority of students met or exceeded expectations. Compared to previous years, there was a slight increase to the writer’s overall ability to convey their ideas in an orderly, logical way.Writers are strongly encouraged to seek assistance from the Writing & Communication Center on campus to refine and improve their proofreading abilities. Faculty are encouraged to allow students extra class time to submit their documents for peer review. Wherever possible, instructors should give out samples of documents (both academic and professional) to model professional-level writing for all students.**Verbal Communication**: Students easily met or exceeded expectations.Faculty should give the students more opportunity to speak in front of the class, to gain experience and confidence. Faculty should also consider giving out style templates with minimum text size, recommended fonts, and examples of clear, uncluttered layouts. Faculty should take more care in creating their own PowerPoint decks and be sure they are modeling best practices. Students can also be encouraged to visit the Writing & Communication Center for extra help developing slides and practicing their oral delivery |
| MBA – 2. Students can interact effectively in teams.  | Task Management Relationship Management skills | Student groups in *MGT 699 Organizational Behavior and Design* work in teams throughout the semester. The students were assessed at the end of the semester, for effective team interaction using self and peer evaluations, similar to a 360 degree feedback.  | Interviews with representative team members about the students’ teamwork competencies. | **Task & Relationship Management**:The majority of students met or exceeded expectations via assessment.Although, a content analysis of the interviews revealed that the students illustrate Relationship Management competencies to a greater extent, and can improve on engagement in Task management skills.Those who did not meet expectations will be advised to review the behavioral guidelines for facilitating-task accomplishment (Whetten & Cameron – Developing of Managerial Skills, 2020) at the beginning of Spring 2023. The material will be provided as a pdf for the students. |

# Master of Science in Information Systems (MSIS) - Significant Changes Related to AoL Assessment Process

**Masters of Science in Information Systems (MSIS)**

**Top Significant changes made to this program driven by Assurance of Learning. Also includes structural changes influenced by input from advisory board, alumni, market need, etc.**

**INTRODUCTION AND OVERVIEW OF MSIS**

#  CURRICULUM CHANGES - Influenced by AOL

|  |  |
| --- | --- |
| **1** | MIS 630 Data management was split into MIS631 Data Management (Lecture) and MIS632 (Lab) – this allowed students to gain more direct one-on-one assistance and guidance on using the tools associated with data management and database design, including using ERWIN Data Modeler. |
| **2** | Added the Industry Capstone Experience to the Program. It consists of two courses:* MGT 808 – Consulting Training Course (not for credit)
* MGT 809 – Industry Capstone Experience (3 credits)
 |
| **3** | Promoted of MGT 808 to all students entering in the Fall of 2021. The number of students is limited by the number of professors/alumni with consulting experience to provide the training in a WebCampus format. Demand for the courses exceeds our capacity but we plan on having 3 full sections (~150 students) to be able to take this course in Fall 2022. The MSIS program is the largest programs of the Graduate School. This class will remain as optional until we can have enough professors to teach the class to all students |
| **4** | Promotion of MGT 809 to all students in every semester.MGT 808 is a requirement before taking MGT 809 – Industry Capstone Project (ICP). ICP teams are matched to each client’s requirements for the consulting engagement and the capabilities of students across all programs to contribute to solving the company’s issue at hand. Many of the ICP projects in 2021-2022, many teams had 1-3 members of the MSIS Program participating and contributing – primarily in the areas of process innovation, business intelligence and analytics, service innovation, and systems solutions architecting. |
| **5** | Post Pandemic – The MSIS Program is reestablishing its Advisory Board, who will be more directly available to interactions with students and in reviewing final group presentations in key core classes, including MIS 730 Integrating Large IS Systems. |

# STRUCTURAL CHANGES – Influenced by Advisory Board, Alumni, market needs, etc.

|  |  |
| --- | --- |
| 1 | MSIS plans on implementing a new montorship program with alumni 2-5 years after graduation during the 2022/2023 Academci Year. Working with the other programs and COPA, the MSIS program is assisting in developing industry specific lists and will try to match mentors based on the industry each student is interested in working in. It is very important students begin understanding the different careers, positions, and skill sets required to succeed in each industry. This especially applies to students who intend to take up a concentration in BIA. The analytics required for retail/fashion might include social networking analytics and supply chain analytics, whereas these might not make as much sense in a commercial banking organization. In a banking environment, multivariate analytics and blockchain may be more appropriate to take, given students have four electives they can take as part of the MSIS degree. Beginning in this Fall, the MSIS Program Director will be working with COPA to ensure resumes are tuned for the target industry. Industry panels will be established with alumni that represents multiple areas of focus/responsibility to educate students on how new products and services are delivered through collaboration and complimentary skills is a team structure; through product, technology, and human centered design, supported by data and process changes in the company, industry and integration with cloud products, services, and capabilities. |
| 2 | The Network and Communications Management Services Masters Program is currently being sunsetted. Classes are continuing for students currently in the program. We are discussing the possibility moving several of these classes to create a four course Network and Communications concentration within the MSIS degree. There is a great demand for business students who are also well versed in the major technological shifts occurring today in telecommunications (5G and other wireless systems); cloud computing and services, 3rd party cyber security services; the Internet-of-Things, AI and smart devices, as well as compliance, privacy, and management of these complex, ecosystems. |
| 3 | MGT 609 – Project Management is a required course for the MSIS Program. We believe all graduates will be asked to manage projects, increasing over time with their increasing responsibilities. Our students will benefit from the Structural Changes outlined above by the Management Program with their closer ties with the Project Management Institute. |

**WHAT COMPETENCIES WERE MET AND WHAT CHANGES WERE MADE BECAUSE OF DIRECT AND INDIRECT MEASURES**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Goal | Competencies | Direct Measure | Indirect Measure | Outcome |
|  |  |  |  |  |

# MS Management (MSM) - Significant Changes Related to AoL Assessment Process

**Masters of Science in Management (MSM)**

**Top Significant changes made to this program driven by Assurance of Learning. Also includes structural changes influenced by input from advisory board, alumni, market need, etc.**

**INTRODUCTION AND OVERVIEW OF MSM**

The master's degree in Management helps students with limited exposure to business to round out their résumés with practical instruction that teaches them how leadership, innovation, economics and strategy shape and define the roles they'll play in industry. Employers see graduates of the Stevens Management program as ideal job candidates who need little training, as their education prepares them to create immediate impact at work.

Program goals, as related to Assurance of Learning:

1. Students can communicate effectively in written and oral presentations.
2. Students can interact effectively in teams.
3. Students will understand how a firm uses technology for competitive advantage in satisfying its business strategy.
4. Students will be able to effectively utilize analytic problem-solving skills.

Via a survey of continuing and graduating students, the majority of graduate management student respondents assessed a significant level of improvement in each of the skills and abilities mentioned above (compared to their skills prior to starting their program). Overall, they expressed valuing: assessments by instructor, utilization of simulations, and incorporation of other interactive and experiential exercises.

# CURRICULUM CHANGES - Influenced by AOL

|  |  |
| --- | --- |
| **1** | I**n support of Goals 2 and 4**, we incorporated a group simulation exercise which exposed students to real-time decision-making. This helped students practice collaboration and strategic thinking. (MGT 699) |
| **2** | Case study content was contemporized in the following courses: MGT 506, MGT 689, and MGT 609.  |
| **3** | Utilized the "Boosted Learning" initiative. This included weekly emails of multiple choice questions to promote in-class interaction and post-semester student engagement. (MGT 609) |
| **4** | **In support of Goal 1**, we required students to present case studies. (MGT 657) |

#  STRUCTURAL CHANGES – Influenced by Advisory Board, Alumni, market needs, etc.

|  |  |
| --- | --- |
| 1 | Graduate Management Program implemented a new mentorship program. This program matches students with a professional mentor in their industry of interest. The mentorship program aims to help students become more familiar with their industry of interest and broaden their understanding of the professional opportunities available. Via monthly meetings, mentors are expected to guide students through the job search process and advise best practices to position themselves and articulate their value to future employers.  |

**WHAT COMPETENCIES WERE MET AND WHAT CHANGES WERE MADE BECAUSE OF DIRECT AND INDIRECT MEASURES**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Goal | Competencies | Direct Measure | Indirect Measure | Outcome |
| MSM – 2. Students can interact effectively in teams.  | Task Management Relationship Management skills | The main assessment exercise used for the Direct Measure is entitled U’ Inc. or Skills Analysis paper. Using a corporation as a metaphor, students are required to prepare a detailed analysis of their personal “mission, vision, assets, and liabilities”, when it comes to managing and leading collaboratively. This assignment is embedded within EMT 740 Team Leadership Development. | Interviews with representative team members about the students’ teamwork competencies. | **Task & Relationship Management**:The majority of students met or exceeded expectations via assessment.Although, a content analysis of the interviews revealed that the students illustrate Relationship Management competencies to a greater extent, and can improve on engagement in Task management skills.Those who did not meet expectations will be advised to review the behavioral guidelines for facilitating-task accomplishment (Whetten & Cameron – Developing of Managerial Skills, 2020) at the beginning of Spring 2023. The material will be provided as a pdf for the students. |

# MS Technology Management (MSTM/EMBA) - Significant Changes Related to AoL Assessment Process

**Masters of Science in Technology Management/Executive MBA (MSTM/EMBA)**

**Top Significant changes made to this program driven by Assurance of Learning. Also includes structural changes influenced by input from advisory board, alumni, market need, etc.**

**INTRODUCTION AND OVERVIEW OF MS TECHNOLOGY MANAGEMENT**

The MSTM and EMBA degrees recognize that executive-level courses must offer a strong technology perspective to be relevant in a fast-changing world. Our courses in marketing, finance, strategy, and operations emphasize the use of analytical tools that are changing how decisions are made in these disciplines. Faculty teach students to approach problems with entrepreneur-like flexibility and use emerging technologies to become an innovator who brings greater sophistication and efficiency to the enterprise. The cohort format of this program fosters teamwork and collaborative learning.

Program goals, as related to Assurance of Learning:

1. Students can communicate effectively in written and oral presentations.
2. Students can interact effectively in teams.
3. Students will understand how a firm uses technology for competitive advantage in satisfying its business strategy.
4. Students can identify, assess, launch, and lead organizational strategic initiatives in a technology-based environment for the creation of new business models (i.e., corporate entrepreneuring) in a large corporation including both sustaining and disruptive businesses.

Via a survey of continuing and graduating students, the majority of graduate management student respondents assessed a significant level of improvement in each of the skills and abilities mentioned above (compared to their skills prior to starting their program). Overall, they expressed valuing: assessments by instructor.

# CURRICULUM CHANGES - Influenced by AOL

|  |  |
| --- | --- |
| **1** | **In support of Goals 3 and 4,** we created new practicum course that challenged learners to integrate and apply concepts, tools, and other knowledge learned throughout their program of study. This course put a particular emphasis on developing and applying critical thinking skills. (EMT 810) |
| **2** | **In support of Goals 3 and 4,** we introduced strategic project management course. This course explored why project management has become one of the most important mechanisms for organizations to achieve results. Students examined the twelve knowledge domains as the basis for project management and developed a working knowledge of how projects are determined, initiated, prepared, implemented, and completed. Lastly, this course briefly discussed Project Management Institute® and its certifications including the Project Management Professional (PMP)® and Certified Associates in Project Management (CAPM)®. (EMT 800) |
| **3** | **In support of Goals 1 and 2**, we made course adjustments, including: more time for instructor coaching on student projects, additional student presentations exploring ongoing development of projects, and incorporating contemporized case studies. These adjustments were aimed to enhance students’ communication, presentation, and collaboration skills. (EMT 752)  |

#  STRUCTURAL CHANGES – Influenced by Advisory Board, Alumni, market needs, etc.

|  |  |
| --- | --- |
| 1 | **In support of Goal 3**, we developed a proposal to reorganize MSTM/EMBA curriculum such that the technology and innovation management courses occur earlier in the program. This was done to emphasize the technology management aspect of the curriculum after taking into consideration a systematic review of other Technology Management degrees.  |

**WHAT COMPETENCIES WERE MET AND WHAT CHANGES WERE MADE BECAUSE OF DIRECT AND INDIRECT MEASURES**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Goal | Competencies | Direct Measure | Indirect Measure | Outcome |
| MSTM/EMBA – 4. Students can identify, assess, launch, and lead organizational strategic initiatives in a technology-based environment for the creation of new business models (i.e., corporate entrepreneuring) in a large corporation including both sustaining and disruptive businesses. | Business Model Development | EMT 752 Corporate Entrepreneurship, student teams develop a new project with an accompanying business plan for one of the member companies. The objective is to get initial funding for the project by the conclusion of the course. |  | 90% of students met or exceeded expectations. Two students failed to provide a compelling business model innovation to a group of executives. This is a high independent criterion.Continue to work with students on how to develop and present and compelling business case. |

# MS Finance (MFIN) - Significant Changes Related to AoL Assessment Process

**Top Significant changes made to this program driven by Assurance of Learning. Also includes structural changes influenced by input from advisory board, alumni, market need, etc.**

**INTRODUCTION AND OVERVIEW OF MS Finance**

# CURRICULUM CHANGES - Influenced by AOL

|  |  |
| --- | --- |
| **1** | Introduced direct and indirect measurements in our courses, starting in the Fall semester. |

#  STRUCTURAL CHANGES – Influenced by Advisory Board, Alumni, market needs, etc.

|  |  |
| --- | --- |
| 1 | Restructured the MFIN program to have three concentrations:* Investment Banking and Valuation (IBV)
* Financial Analytics and Risk (FAR)
* Wealth Management / Certified Financial Planner (WM/CFP)

This helps to better respond to the evolving industry needs for skills among Finance graduates |
| 2 | We introduced five new courses: * FIN 616 – Managerial Economics (replaces MGT 506 as a more advanced core course)
* FIN 648 – International Finance (elective; IBV concentration)
* FIN 658 – Wealth Management Principles and Practices (elective; WM/CFP concentration)
* FIN 688 – Mergers, Acquisitions, Other Corporate Restructuring (elective; IBV concentration)
* FIN 540 – Sustainable Finance (elective; currently in IBV and WM/CFP concentrations)

These courses were introduced to enhance our core, and to complete the IBV and WM/CFP concentrations. Also, the Sustainable Finance course is the first toward building a Sustainability Track, i.e., concentration, and potentially a Sustainable Finance degree in the future. |
| 3 | Added the Capstone Experience to the Program. It consists of two courses:* MGT 808 – Consulting Training Course (not for credit)
* MGT 809 – Industry Capstone Experience (3 credits)
 |

# MS Financial Engineering (FE) - Significant Changes Related to AoL Assessment Process

**Masters of Science in Financial Engineering (FE)**

**Top Significant changes made to this program driven by Assurance of Learning. Also includes structural changes influenced by input from advisory board, alumni, market need, etc.**

**NOTHING TO REPORT**

**INTRODUCTION AND OVERVIEW OF MS FINANCIAL ENGINEERING**

# CURRICULUM CHANGES - Influenced by AOL

|  |  |
| --- | --- |
| **1** |  |
| **2** |  |
| **3** |   |
| **4** |  |

#  STRUCTURAL CHANGES – Influenced by Advisory Board, Alumni, market needs, etc.

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |

WE NEED TO IDENTIY WHAT COMPETENCIES WERE MET AND WHAT CHANGES WERE MADE BECAUSE OF DIRECT MEASUREMENTS AND IN-DIRECT MEASUREMENTS

# 11. MS Financial Analytics (FA) - Significant Changes Related to AoL Assessment Process

**Masters of Science in Financial Analytics (FA)**

**Top Significant changes made to this program driven by Assurance of Learning. Also includes structural changes influenced by input from advisory board, alumni, market need, etc.**

**INTRODUCTION AND OVERVIEW OF MS FINANCIAL ENGINEERING**

# CURRICULUM CHANGES - Influenced by AOL

|  |  |
| --- | --- |
| **1** |  |
| **2** |  |
| **3** |   |
| **4** |  |

#  STRUCTURAL CHANGES – Influenced by Advisory Board, Alumni, market needs, etc.

|  |  |
| --- | --- |
| 1 | Implemented 3 different concentrations: FINTECH and Machine Learning ConcentrationData Science and Optimization ConcentrationAdvanced Risk Analytics ConcentrationThis was done to provide an edge to our alumni entering the workforce |
| 2 | We introduced two new courses: FA631 Investment, Portfolio Construction, and Trading AnalyticsFA636 Advanced Financial Risk AnalyticsThese courses were introduced to complete the Data Science and Advanced Risk Concentrations for a more comprehensive treatment of each of the subjects.  |

All changes were made after intense consultations with alumni. We also identified market needs as detailed through discussions with Industry representatives who hire our alumni.

# PHD Programs - Significant Changes Related to AoL Assessment Process

**Doctor of Philosophy in Business Administration**

**Top Significant changes made to this program driven by Assurance of Learning. Also includes structural changes influenced by input from advisory board, alumni, market need, etc.**

**INTRODUCTION AND OVERVIEW OF PHD in BA**

The SSB’s Business Administration Ph.D. program prepares students to become rigorous and thoughtful researchers who can think about creative applications of technology and quantitative methods in building innovative solutions and designing new mathematical models for asset pricing, risk management, portfolios optimization, etc.

The doctoral program is built around three areas of research expertise of School of Business faculty namely Finance, Information System and Analytics, and Entrepreneur and Innovation Management. Students who complete the program will be prepared to lead academic and institutional research.

The current iteration of AoL goals in the Doctorate program reflects the school's desire to empower students to conduct cutting-edge research and communicate such work to a broader audience. Existing courses are modified and designed to keep abreast with current research techniques and have real-world applicability. Students are encouraged to enhance their public speaking skills and present their work at research seminars internally and externally.

Program goals, as related to Assurance of Learning:

1. *Goal 1*. Students can communicate effectively in written and oral presentations and structure research papers.
2. *Goal 2.* Ph.D. graduates master the core knowledge and research tools in their major field of study.
3. *Goal 3*. Ph.D. students demonstrate capacity to identify and develop a research project for their dissertation in a timely fashion and effectively disseminate knowledge through classroom teaching.

**CURRICULUM CHANGES - Influenced by AOL**

|  |  |
| --- | --- |
| **1** | We have made the program more exposed to feedbacks, both from the academic perspective and from the industry perspective. From the academic perspective, we have made the courses more global in nature. We have introduced the world economic problems along with US economic problems. Second, we have made the curriculum more interdisciplinary in structure by exposing all students to a core management course (MGT 712) and a course on the Perspective of information system technology (MIS 735).  |
| **2** | We introduced the following two new courses:* MGT 712 Survey of Management and Organization Theories
* FIN 730 Information Economics
 |
| **3** |  We organized “brown-bag” seminar series for our third year and fourth year PhD students. Students present research, bring out the relevance to their area of study and also highlight the importance of their research in solving real-world problems. We invite the scholars from the area, the school and outside the school to dissimilate knowledge to broader community of researchers and practitioners.  |
| **4** | All students in the Ph.D. in Business Administration take the following six core courses in economic theory, statistics, econometrics, management/organization theory and research design.  In addition to the above courses, all students take two independent study courses and three electives from master's or doctoral programs at Stevens. |

 **STRUCTURAL CHANGES – Influenced by Advisory Board, Alumni, market needs, etc.**

|  |  |
| --- | --- |
| 1 | We have formed sub-committees of advisory board where PhD students also take part and opt-in cutting edge research ideas from top-notch practitioners. (Learning from the public).  |

The students are interacting with the business community much more than they used to do before. This helps them to get feedback on how practitioner think, what problems they are facing and allow them to use the feedback to design the research projects.

The students are communicating to the business community and able to enhance their knowledge about the logic and techniques of solving various business problems.

We encourage our students to participate in international conference to understand the global perspective on certain business problems, rather than restricting them to the domestic issues.

**Doctor of Philosophy in Financial Engineering**

**Top Significant changes made to this program driven by Assurance of Learning. Also includes structural changes influenced by input from advisory board, alumni, market need, etc.**

1. **INTRODUCTION AND OVERVIEW OF PHD FE DEGREE**

The PhD program in Financial Engineering is a rigorous Ph.D program that prepares students to become future researchers in the area of financial engineering or related areas. It is a science/engineering discipline based out of a business school. It is unique for the emphasis on preparing students to become leading researchers who bring a problem-solving perspective to the emerging challenges in the financial world.

The doctoral program is built around six areas of research: algorithmic and high frequency trading, asset pricing and behavior finance, portfolio optimization, systemic risk, mathematical finance, and financial analytics and innovation.

Since 2017, the program followed strong assurance of learning processes, and three goals are established: 1. FE Ph.D. graduates can effectively communicate research in oral presentations. 2. FE Ph.D. graduates will have sufficiently mastered the core knowledge and tools needed to conduct original research in a timely manner. 3. FE Ph.D. graduates are able to effectively deliver academic courses in a university environment.

Below, we have summarized the changes that have resulted from the AOL assessment feedbacks.

CURRICULUM CHANGES - Influenced by AOL

|  |  |
| --- | --- |
| **1** | Influenced by AOL goal #1, we have implemented evaluation forms in weekly PhD colloquiums, in which PhD students present their research and are evaluated by faculty advisors on their oral research communications.  |
| **2** | Influenced by AOL goal #2, we have implemented a PhD preliminary exam by the end of the first year and at the beginning of year 2 of the PhD study. This is to make sure the students have mastered the key knowledge to move on to the next phase of research. This measure is implemented to ensure that the students are well-prepared and can graduate in a timely manner.  |
| **3** |  Influenced by AOL goal #3, we have assigned final year PhD students to at least teach one course as an independent instructor. This strengthens their teaching and communication skills, and better prepare them for future academic careers.  |

 STRUCTURAL CHANGES – Influenced by Advisory Board, Alumni, market needs, etc.

|  |  |
| --- | --- |
| 1 | Drawing on AOL, we encourage and allocate funding for the PhD student in their last year to attend a major conference in their field and present their research. This provides indirect measure of the student’s ability to orally communicate research. We also require PhD students who pass their qualification exam to speak at least once in the weekly PhD colloquium. We collect the number of oral presentations done by each of the students.  |
| 2 | Drawing on AOL, we keep a record of the number of working papers, publications and referred conference papers of PhD students who have passed their qualification exam. We also provide an indirect measure through conducting a survey on the topics of PhD colloquiums. This survey of topics will help us evaluate the depth of their knowledge and progress they make.  |

**Doctor of Philosophy in Data Science**

**Top Significant changes made to this program driven by Assurance of Learning. Also includes structural changes influenced by input from advisory board, alumni, market need, etc.**

**FIRST YEAR IN AOL – NOTHING TO REPORT**

**INTRODUCTION AND OVERVIEW OF Doctor of Data Science**

# CURRICULUM CHANGES - Influenced by AOL

|  |  |
| --- | --- |
| **1** |  |
| **2** |  |
| **3** |   |
| **4** |  |

#  STRUCTURAL CHANGES – Influenced by Advisory Board, Alumni, market needs, etc.

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |

WE NEED TO IDENTIY WHAT COMPETENCIES WERE MET AND WHAT CHANGES WERE MADE BECAUSE OF DIRECT MEASUREMENTS AND IN-DIRECT MEASUREMENTS