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**Revised: July 2024**

**Improvements Driven by Assurance of Learning**

**Listed by Program**

**Academic Year 2023/2024**

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# BS in Business – Significant Changes Related to AOL Assessment Process: Academic Year 2023/2024

***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.**

# INTRODUCTION AND OVERVIEW OF BS BUSINESS DEGREE

# INTRODUCTION AND OVERVIEW OF BS BUSINESS DEGREE

The BS Business program includes the following majors: Business & Technology, Marketing Innovation & Analytics; Finance, Management, Information Systems, Accounting and Analytics, and Economics**.** The program offers the following minors as well: Marketing Innovation and Analytics, Information Systems, Entrepreneurship, Finance, Accounting and Analytics, Economics, Quantitative Finance, and Management. **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 the academic year 2013-2014, and it took the place of BS Business & Technology, which has been running since the 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.** Ever since 2007, under the BS Business & Technology degree, the program has followed strong assurance of learning processes that are being upheld with the BS Business degree to date. Scholars across majors share the same core curriculum, that comprises the Liberal Arts and Science Core, Business Core, and Practice Core.

Since 2007, under the BS Business & Technology degree, the program has been adhering to robust assurance of learning procedures that are being continued with the BS Business degree until the present. The goals of the program have been assessed **9-11** 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. The program goals, as related to Assurance of Learning:

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| BSB - 1. Students can communicate effectively in written and oral presentations. |
| BSB - 2. Students can interact effectively in teams. |
| BSB - 3. Students will be able to formulate and articulate plans to align business and IT. |

Additional detailed results from goal assessments and corresponding steps taken to address those specific goals are recorded 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

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|  | New Courses - Frontiers of Technology were introduced. Students will be required to take 3 out of the 5. This is associated with goal 3. |
| 1 | PRV 201 The Frontiers of Technology - A.I. and Machine Learning, associated with goal 3. |
| 2 | PRV 202 Data Science and Analytics, associated with goal 3. |
| 3 | PRV 203 The Frontiers of Technology – Biotechnology, associated with goal 3. |
| 4 | PRV 204 The Frontiers of Technology – Sustainability, associated with goal 3. |
| 5 | PRV 205 The Frontiers of Technology - Quantum Technology, associated with goal 3. |
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| 6 | New Course - The Future of work in the age of AI was introduced. Associated with Goal 3 |

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

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|  | New courses were added to the following major, minor and concentrations |
| 1 | **MAJORS** |
|  | **Finance Major**  Add Elective:  FIN 540 Sustainable Finance |
|  | **Economics Major**  Add Elective:  ECON 401 The Future of Work in the Age of AI |
|  | **Marketing Innovation and Analytics Major**  Add Elective:  BT 404 Marketing, Society and Sustainability |
|  | **Management Major**  Add Elective:  MGT 550 Sports Management |
|  | **Quantitative Finance Major**  Add Electives:  MIS 401 Deep Learning and LLM for Business Analytics  BIA 568 Management of AI Technologies  ECON 401 The Future of Work in the Age of AI |
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| 2 | **MINORS** |
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|  | **Economics Minor (BSB students, QF Majors, Non-SSB Students)**  Add Elective:  ECON 401 The Future of Work in the Age of AI |
|  | **Marketing Minor**  Add Elective:  BT 404 Marketing, Society and Sustainability |
|  | **Management Minor**  Add Elective:  MGT 550 Sports Management |
|  | **Economics Minor (SSB students, Non-SSB Students)**  Add Elective:  MGT 550 Sports Management |
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| 3 | **CONCENTRATIONS** |
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|  | **Business Concentrations for B&T Majors**  **Finance Concentration**  Add electives:  FIN 420 A Survey of Topics in FinTech  FIN 540 Sustainable Finance |
|  | **Economics Concentration**  Add elective:  ECON 401 The Future of Work in the Age of AI |
|  | **Marketing Concentration**  Add elective:  BT 404 Marketing Society and Sustainability |
|  | **Management Concentration**  Add elective:  MGT 550 Sports Management |
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|  | **Technology Concentrations for B&T Majors**  **Data Analytics Concentration**  Add Electives:  MIS 401 Deep Learning and LLM for Business Analytics  BIA 568 Management of AI Technologies |
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|  | **Concentrations for QF Majors**  **Finance Concentration**  Add elective:  FIN 540 Sustainable Finance |
|  | **Economics Concentration**  Add elective:  ECON 401 The Future of Work in the Age of AI |
|  | **Data Analytics**  Add Electives:  MIS 401 Deep Learning and LLM for Business Analytics  BIA 568 Management of AI Technologies |
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| 4 | **IS Requirements for all SSB Majors except QF majors**  Add Electives:  MIS 401 Deep Learning and LLM for Business Analytics  BIA 568 Management of AI Technologies |
|  |  |
| 5 | **Technology Electives for all SSB Majors except B&T and QF Majors**  Add Electives:  MIS 401 Deep Learning and LLM for Business Analytics  BIA 568 Management of AI Technologies |
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**WHAT COMPETENCIES WERE MET, AND WHAT CHANGES WERE MADE BECAUSE OF DIRECT AND INDIRECT MEASURES**

**Particular competencies**: There are **particular competencies** that are needed in teamwork that AOL goal 2 attended in BT 330. 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; and encouraging ideas and opinions even when they differ from his/her own. Several specific task and relationship management behaviors, relate to AOL goal 3, too, including demonstrating creative and innovative thinking.

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

**Direct measure:** Students work in teams all through the semester. Team members complete a team appraisal of their peers similar to a 360-degree assessment to evaluate AOL Goal 2, effective interaction in teams. In BT 330 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 generates 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 centers on. The feedback from the assessment enables the students to understand what behaviors they can improve to become more effective team members.

**What competencies were met:**

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

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| Objective 1 | **Task management** skills |
| Key underlying themes observed | **Competency features met**: 1. suggesting new approaches to solving problems; 2. defining task priorities for overall projects; 3. ensuring goals are understood by all.  **Competency features not met:**  The interviewees for the teams thought that each team should 1. continue to make more headway on striving to clarify better roles and responsibilities for individual members of the team prior to each weekly collaborative |
| Objective 2 | **Relationship management** skills |
| Key underlying themes observed | **Competency features met**: 1. reinforcing the contributions of others; 2. Sharing information with others; 3. working towards solutions and compromises that are acceptable to everyone involved.  **Competency features not met**:  The interviewees for the teams felt that each team should continue to improve on 1. Encouraging others to express contrary views than one’s own. |
| **Changes:** Corrective action | Following the underlying themes revealed from the interviewee replies, the students will be steered to go over the behavioral guidelines for *task management and relationship managing skills* to augment these behaviors (Robbins and Judge, Organizational Behavior, 18th Edition) at the commencement of Fall 2024. The material will be shared as a pdf for class participants as well |

# 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

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| 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: | The outcomes for Learning Objective 1 and Learning Objective 2 exemplify that the scholars either met or exceeded expectations. |
| Changes made because of direct measurements: | Taking into account the results, it is noticeable that the greater part of the students met or exceeded expectations on both learning objective 1 and learning objective 2, nonetheless, the scholars will be guided to go through the behavioral principles for facilitating task and facilitating-relationship building behaviors (Robbins and Judge, Organizational Behavior, 18th Edition) at the start of Fall 2024. The material will also be shared as a pdf file for the students. Additionally, a brief slide deck on teams will be shared with the scholars. |

**There are also** **particular competencies** that are needed for communication that the BSB program attended to. The competencies targeted are communicating in writing and presentation delivery. **Writing** skills include: using structure to provide a forecast and build the paper's conclusions; spelling and word choice are fault-free, using Grammarly; ideas are created and explained using examples. **Oral presentation** skills include: Providing the audience with an overview and section transition guidance; conveying enthusiasm for the topic; maintaining eye contact with the audience; using clear slides with a reasonable amount of material per slide and illustrations/ graphics; remaining within time limits, and providing organized responses.

At the end of junior year, team members were interviewed/exit surveyed. The interviews were structured, with representative team members in BT 330. The structured interviews collected information about the key identified competencies described above. The responses were subjected to a content analysis to discover underlying themes.

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| Objective 1 | **Write effectively** skills |
| Key underlying themes observed | **Competency features met**:  1. using structure to provide a forecast; and 2. using the structure to build the paper's conclusions. 3. ideas are created and explained; 4. spelling has improved.  **Competency features not met:**  Scholars interviewed felt that 1**.** ideas were created and explained but not using sufficient examples; 2. word choice is still not fault-free, using Grammarly. |
| Objective 2 | **Deliver presentations** **effectively** skills |
| Key underlying themes observed | **Competency features met**:  1. Providing the audience with an overview; 2. remaining within time limits; 3. conveying enthusiasm for the topic; 4. maintaining eye contact with the audience. 5. providing organized responses.    **Competency features not met**:  The interviewees thought they should carry on improving on  1. using clear slides with a reasonable amount of material per slide and illustrations/ graphics; 2. section transition guidance. |
| **Changes:** Corrective action | *In terms of objective 1, faculty should be attempting to revise their writing prompts to include more personal examples, experience and analysis. This could also force students to rely less on AI. As always, we strongly encourage all students to utilize the resources of the Writing & Communications Center for personal feedback and writing assistance.*  *Further, regarding objective 2, faculty should do their best to model good presentation practices, both in their own public speaking and the clarity of their slides. Faculty teaching online should be aware that online presenting, while useful, is not a substitute for speaking to a room full of people. The Writing & Communications Center is also a good resource for students for assistance with creating and delivering their presentations.* |

# 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**

**CURRICULUM CHANGES - Influenced by AOL**

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

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| 1 | FinTech concentration was introduced |
| 2 | Current acceptable AMP (accelerated masters program) courses were evaluated for relevancy |
| 3 |  |
| 4 |  |

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

**Masters of Science in Business Intelligence and Analytics (BI&A) - 2023 to 2024**

**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**

The Master of Science in Business Intelligence & Analytics (BI&A) program at Stevens Institute of Technology offers a robust curriculum aimed at preparing professionals for the data-driven demands of modern industries. Spanning 36 credits, the program combines 9 core courses (27 credits) with 3 elective courses (9 credits), allowing students to customize their learning experience based on their career aspirations. The core curriculum includes fundamental subjects such as business analytics, data management, machine learning, and optimization, culminating in a practicum that provides hands-on experience.

Students can specialize in one of three concentrations to align with their career goals. The **Data Analytics** concentration focuses on business and data analysis, covering topics like social network analytics and marketing analytics. The **Data Science & AI** concentration is tailored for those pursuing data science and AI roles, with advanced courses in machine learning, deep learning, and augmented intelligence. The **Big Data** concentration prepares students for data engineering and scientist roles, including courses on big data technologies and data stream analytics.

The program is supported by an Industry Advisory Board, which provides valuable insights into industry trends and job opportunities. Additional features include the option for international students to participate in internships through Curriculum Practical Training, certificate programs in various analytics fields, and the use of MOOCs for supplementary learning and industry certification. Students benefit from mentorship, job skills workshops, networking events, and practical experiences such as industry consulting projects and competitions.

**CURRICULUM CHANGES – Influenced by Indirect Measures**

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| **1** | **Two-Part Comprehensive Assessment:** The comprehensive assessment was split into two parts: one assessing disciplinary knowledge and the other evaluating the application of this knowledge to real business problems. |
| **2** | **Enhanced Communication Skills:** Efforts were made to improve communication skills, particularly for students new to English, by encouraging recorded presentations and video summaries. |
| **3** | **Exit Survey Feedback:** An exit survey conducted in May 2023 indicated high satisfaction with the program and professional development activities, leading to further program improvements. |

**CURRICULUM CHANGES - Influenced by AoL**

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| **1** | **Emphasis on Application of Disciplinary Knowledge:** A significant change as a result of the Assurance of Learning in Goal 3 was to break the comprehensive assessment into two parts.  The first part concentrates on assessing disciplinary knowledge and the second part concentrates on evaluating how well students can apply that disciplinary knowledge to solving actual business problems. |
| **2** | **Emphasis on effective stakeholder communication:** Communicate effectively in written and oral communications for students new to English.  Efforts have been made to encourage students to record presentations, and video summaries of their work. Giving them valuable practice in communicating more effectively. |
| **3** | **Focus on continuous improvement by incorporating student feedback regarding the program and it value:** An Exit Survey of graduating students was conducted in May 2023. We received 50 responses. The graduates gave several detailed suggestions for improvement in various aspects of the program. The competence goal results were as follows:   * Goal 5: Quality of Program – 89.2 % of students rated the BI&A program as “Good” or better. * Goal 6:  Professional Development - 96.1% students rated our professional development activities as  “Useful” or better.   A better understanding of progress on these two goals will be obtained from the May 2024 Exit Survey. |

**STRUCTURAL CHANGES - Influenced by Advisory Board, Alumni, and Market Needs**

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| **1** | **Broadened our experiential learning in AI with the courses in Generative AI:** These courses (BIA 662 Augmented Intelligence and Generative AI, BIA 810 Developing Business Applications Using Generative AI) provide students with a “hands-on” opportunity to build real-world business applications, as well as explore how knowledge-based AI, generative AI, and deep learning are impacting the field of big data analytics and evidence-based decision making. |
| **2** | **Broadened our experiential learning in Business Analytics:** With the introduction of a course in Healthcare Data Analytics.  Building upon foundational knowledge in data analytics, this course introduces students to cutting-edge machine learning algorithms and data engineering techniques that are revolutionizing how pharmaceutical companies predict market trends, optimize sales strategies, and personalize marketing efforts. |
| **3** | **Enhancing our student’s professional profile:** Enhanced our emphasis on students compiling a portfolio of their work extending beyond their CV.  Helping students gain a competitive advantage in highlighting not only what they’ve done, but how they’ve done it. |
| **4** | **Introduced Causal Inference in Required Statistics Course:** We introduced causal inference as a topic in BIA 654 Experimental Design to improve our students' ability to reason about data. |

**IMPACT OF SIGNIFICANT CHANGES**

The significant changes in the program driven by AOL measures, have contributed to a Master's programs in Business Intelligence and Analytics (BI&A) which has equipped graduates with an opportunity to build and demonstrate the skills necessary to have impact in the realm of data-driven business decision-making. Graduates of the program have the capacity to not only utilize traditional business intelligence techniques to analyze historical data, but also advanced analytics methods, including machine learning and artificial intelligence, to predict future outcomes and prescribe optimal actions. The degree and its continuous improvement ensures that students are well-prepared for professional roles in business analytics, data engineering, as well as data science and artificial intelligence.

# 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 the advisory board, alumni, market need, etc.**

**INTRODUCTION AND OVERVIEW OF EPM PROGRAM**

The M.S. in Enterprise Project Management (EPM) degree program prepares students and organizations for the future in project management by focusing on the business side of managing projects. It is designed for people who work or plan to work in project-driven organizations and who want to excel in managing enterprise-level projects and programs. The program develops a business mindset enabling the consideration of business aspects in the decision process.

The curriculum includes courses that provide a foundation in business management, courses that cover project management methodologies and techniques, and courses that enable students to understand and lead change in an enterprise. It is a 10 course, 30 credit program.

The Learning Goals for the EPM program are listed below.

1. Our students will be effective communicators.
2. Our students will interact effectively in teams.
3. Students demonstrate mastery of project management knowledge areas and tools to create value for key stakeholders of projects.
4. Students understand how to influence and lead enterprise projects.

Via a survey of graduating students, the majority of graduate management student respondents (50+) assessed, reported that their EPM experience somewhat or significantly improved their abilities (compared to their skills prior to starting their program) in relation to the program goals above and the competencies associated with them. Experiential aspects (assignments, projects, simulations, collaborative learning) of their education were reported to be most instrumental to students' skill development, although they also valued interaction with faculty and peers.

# CURRICULUM CHANGES - Influenced by AOL

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| **1** | Faculty have been provided guidance on adding AI-related content to courses. This includes creating learning assignments that utilize AI-generated content. (e.g. students use AI to assist them in the creation of personal mission and vision statements). Faculty have also been directed to have AI-related usage policies. Communication (goal 1), problem-solving skills (goal 4). |
| **2** | An ethics lecture is included as part of MGT 609 *Project Management Fundamentals*. The lecture covers both general business ethics issues as well as issues specifically faced by project managers. |

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

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| 1 | Participated and obtained PMI (GAC) accreditation (from 2023 to 2028) |
| 2 | We hosted the first International AIA PM (Artificial Intelligence Applications in Project Management) Workshop on Campus. AIA PM is a cross-disciplinary research area that has emerged from Computer Science, Management Science, Organizational theory, Economics, Engineering, and Technology. |
| 3 | We revised our course attendance policy (School-wide policy). Students can only miss two classes before there will be grade implications. |
| 4 | We expanded and revised the composition of our management program Advisory Board. This includes ensuring broader industry representation by adding representatives from MasterCard, Google, Pfizer, and BD. This includes the installation of a new Board chairperson from Google. |
| 5 | The Advisory Board formed subcommittees to provide guidance and recommendations for all graduate management programs. |

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| 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* produces two copies of a 4-page essay that is 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 in their 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. When appropriate, instructors should give out samples of documents (both academic and professional) to model professional-level writing for all students. In several courses, however, we instead focus on providing detailed assignment outlines and encourage students to submit work for review prior to submitting their final versions.    **Verbal Communication**:  Students easily met or exceeded expectations.    During the past year, our efforts to reduce overall class sizes helped provide students with more opportunity to speak in front of the class, to gain experience and confidence. Students are also 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 | Student groups in *MGT 699 Strategic Management* 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. | Despite the fact that the majority of students met or exceeded expectations on this learning objective, the scholars will be encouraged to review the behavioral guidelines for facilitating-task accomplishment (Whetten & Cameron – Developing of Managerial Skills, 2020) at the commencement of Spring 2025. The information will be accessible as a pdf for the students. |
| EPM - 3. Student demonstrates mastery of project management knowledge areas and tools to create value for key stakeholders of projects*.*  . | ***MGT 609, MGT 610, MGT 611 and MGT 614*** | Every semester | All students in the courses.  This goal requires students to thoroughly understand the basic concepts of project management basics and project value management, how these concepts are used to develop a strategic project plan with the clear focus on value creation for stakeholders of a project as discussed in MGT609, MGT610 and MGT611 and MGT614 courses. | Several students have contacted project management instructors to take professional Project Management certifications either CAPM, PMP or Agile. |
| EPM - 4. Leadership and influence skill application | ***MGT 612*** | Spring semester | All students in the course | The scholars met or exceeded expectations on **understanding how to influence and lead enterprise projects**.  **Remedial actions are not necessary. This course is being implemented well; for example**, the scholars’ remarks exemplify that the course remains a robust learning experience. |

1. **Master of 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 graduating students, the majority of graduate management student respondents (n=39) assessed, reported that their MBA experience somewhat or significantly improved their abilities (compared to their skills prior to starting their program) in relation to the program goals above and the competencies associated with them. Experiential aspects (assignments, projects, simulations, collaborative learning) of their education were reported to be most instrumental to students' skill development, although they also valued interaction with faculty and peers.

**CURRICULUM CHANGES - Influenced by AOL**

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| **1** | Developed and delivered a 1.5 credit immersion week course for our online MBA program. The course focuses on the management of challenges of the fourth industrial revolution and especially supports program learning goals pertaining to: communication (goal 1), and problem-solving skills (goal 4). |
| **2** | We initiated the development of a second 1.5-credit immersion week course. This course will especially support program learning goals pertaining to communication (goal 1), teamwork (goal 2), and problem-solving skills (goal 4). |
| **3** | Designed and delivered inclusive leadership workshops for immersion weekend participants of the online MBA program. Delivered twice during the academic year. communication (goal 1), teamwork (goal 2). |
| **4** | Faculty have been provided guidance on adding AI-related content to courses. This includes creating learning assignments that utilize AI-generated content. (e.g. students use AI to assist them in the creation of personal mission and vision statements). Faculty have also been directed to create AI-related usage policies. Communication (goal 1), problem-solving skills (goal 4). |
| **5** | Although it is an extracurricular initiative, our inclusive leadership certificate program designed and delivered several student workshops that support goal 1 and goal 2. They include a workshop on cross-generational communication, improvisation principles and inclusion; an inclusive scenarios/simulation workshop. The certificate is an additional credential beyond their degree. |

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

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| **1** | We revised our course attendance policy (School-wide policy). Students can only miss two classes before there will be grade implications. |
| **2** | We are pursuing new dual degree options. They include a sports marketing dual degree with Universidad Europa. Other discussions are underway with Universities in Asia, Africa and South America. |
| **3** | We expanded and revised the composition of our management program Advisory Board. This includes ensuring broader industry representation by adding representatives from MasterCard, Google, Pfizer, and BD. This includes installation of a new Board chairperson from Google. |
| **4** | To enhance the diversity of our student population we made concerted marketing efforts that target potential students in South America. This included having the program director make two trips to the region. |
| **5** | The Advisory Board formed subcommittees to provide guidance and recommendations for all graduate management programs. |

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| 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 in their 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. When appropriate, instructors should give out samples of documents (both academic and professional) to model professional-level writing for all students. In several courses, however, we instead focus on providing detailed assignment outlines and encourage students to submit work for review prior to submitting their final versions.    **Verbal Communication**:  Students easily met or exceeded expectations.    During the past year, our efforts to reduce overall class sizes helped provide students with more opportunities to speak in front of the class, to gain experience and confidence. Students are also 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 Strategic Management* 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 on these competencies. Compared to the previous year, the overall, score on the facilitate task accomplishment objective improved. In particular, most of the traits’ scores on the facilitate task accomplishment objective improved, while two of the trait scores remained similar.    Although, a content analysis of the assessment results revealed that Relationship Management competencies tend to be stronger than task management.  Those few who did not meet expectations were 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 is provided as a pdf for the students. |
| MBA 3 -- Our students will be able to develop and analyze descriptive, predictive, and prescriptive models using software tools | The student demonstrates their ability to: - Use descriptive and predictive techniques  - Use Tableau Software  (Load data , develop Visualizations | This goal is assessed inBIA 500/600 Business Analytics: Data, Models & Decisions, which is a required course in the MBA program. | A combination of exam results and project evaluations are used to judge student competence | We were pleased with the fact that 95 percent of the students assessed (n=24) met or exceeded expectations on these competencies |
| MBA 4 --students can effectively utilize analytic problem solving skills. | - Adopt a **long-term view** in the proposal of solutions to analytical problems on strategic issues  - Formulate proposals in which the different elements of the solution show **consistency** among them  **Integrate** different sources of information to expand the decision set to find the best solution to each analytical problem.  -- Find solutions that are **realistic** and can be **implemented** (common sense). | This goal is assessed in EMT 715 (Strategic Business Management) / MGT 699 (Strategic Management); a required core course in the MS in MBA curricula. | The assessment includes individual-level evaluation as well as team-level exercises that are continuously used as a mechanism for the development of analytical skills. | 100 percent of the students assessed met or exceeded expectations on these competencies. In particular there was a slight improvement from the previous year with regard toto the third competency - find realistic, implementable solutions. |

# 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.**

# CURRICULUM CHANGES - Influenced by AOL

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| **1** | Several changes were made to MIS730:   * Continued focus on a holistic view of Systems integration and Solutions Architecting. * Analyzing current initiatives being deployed with AI and generative AI, students will utilize the knowledge they have gained throughout the program in presenting their final product/service pitch utilizing these technologies, strategies, and business models. * Given the massive changes to technology initiatives, our new textbook, Solutions Architect’s Handbook has already been updated to its 3rd Edition just released on March 29th 2024 and this will be used in the Fall 2024 syllabus for one or more class sections.  This book provides a very good structure on the various responsibilities a Solutions Architect needs to play and the many areas this role must interact with in an organization to successfully integrate large IS systems>  The new edition continues to remain timely, relevant, understandable, and relatable. The following are some of the new additions. - a new chapter has been added specifically on generative AI (GenAI) - new topics have been added including clean architecture, CloudOPS, cloud-native architecture, and architecture best practices. * Many of our graduates are going into more consultative, management roles after graduation. We did a 3-year review of MSIS students and found that over 60% of our graduates are in customer-facing, consultative roles. The textbook covers many of the soft skills required in integrating large information systems including how to manage stakeholders, budget projects, create effective teams, and enhance interpersonal skills. |

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| **2.** | MIS 714 was completely refreshed:   * Added mini-cases studies on disruptive service companies:  Multi-sided serviced platforms-Doordash Service -Blockchain - Aura – Fashion sales and distribution blockchain,  - Mediledger (Pharmaceutical sales and distribution ledger),  Cloud-based security services  - OKTA (cloud-based, centralize authentication and security services for work and businesses),  Standards based collaborative technologies - FIDO (Fast- Identity Online) - secure multi-factor authentication for purchasing goods and services while on the interne * Added discussion of AI platforms in service scenarios (e.g., Chatbots, Visualization, and Service Enhancement (ex. Preliminary software coding and coding review) * Added discussion on use of Generative AI   + Amazon: Rollout of Generative AI on reviews of most Amazon products with over 100 reviews   + For MIS714 A section, added mini cases of service companies rolling out customer facing services utilizing Generative AI and AI   + Encouraged Final Group projects to consider Generative AI in all of their project ideas. * Enhanced focus on utilizing mobile data, the internet-of-things, and meta-data to create new service models and service products. |
| **3.** | MIS699 was modified to include more new case studies on crowdsourcing, metaverse, cryptocurrencies, as well as a new “digital innovation pitch” competition that uses the semester-long class project to provide students with a hands-on experience in innovation and business planning.   MIS 699 Textbook Information Systems: A Manager's Guide to Harnessing Technology is an e-book which is crowdsourced by both professors and industry professionals. A new version, version 10 was just published this Spring and will be utilized in the Fall 2024 Semester.   This edition includes two new chapters: Chapter 9 “Shein and Temu: E-Commerce Giants from Asia Grow Globally.”  Chapter 18 “Artificial Intelligence—The Tech Impacting Nearly Every Industry”  The textbook also stresses the latest technologies students need be cognizant of:: AI Related Artificial intelligence (AI), generative AI (GenAI), AI’s promise, AI’s risks and challenges, AI and ethics, the impact of AI on the semiconductor business  Internet of Things: Internet of Things (IoT), robotics, mobility and the sources of data and meta data  Market changes and Ecosystems New market players, updated discussions of existing market players, product and services innovations  ESG Social media platform evolutions, information security, environmental concerns, sustainability, and associated measurements. One study indicates generative AI systems might use around 33 times more energy than machines running task-specific software. Googles data-center emission have jumped 48% in five years due to AI data center boom.  Note: New Companies and Mini-Business Cases and Discussions will be added as well. |
| **4.** | Leveraging new classes offered by the BIA Program   BIA’s Expanded options within the area of AI.   BIA663 Augmented Intelligence and Generative AI is now being offered:  This course provides students with a “hands-on” opportunity to build real-world business applications, as well as explore how knowledge-based AI, generative AI, and deep learning are impacting the field of big data analytics and evidence-based decision making.  It can be used by MSIS students toward pursuing a specialization in Business Intelligence and Analytics as well as the Process Innovation and Service Management specialization |
| **6.** | | Overall, new courses added over recent years within the MIS and BIA programs provide MSIS students a greater number of options of courses within their desired areas of interests as outlined in the Table below. |

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

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| 1 | MSIS has identified a group of successful alumni 2-5 years after graduation. They began participating in several industry and functional panels which were well attended in AY2023-2023. We plan to extend the group as well as the industry panels in the upcoming year.   For next year, new industry panels will be established with alumni that represents multiple areas of focus/responsibility to educate students of the opportunities for digital leaders. |
| 2 | Seminar Series on Conducting an Industry focused Job Search  The MSIS Program Director worked with COPA to ensure resumes are tuned for the target industry. Working with the COPA group, six in-person and online-seminars were conducted with MSIS students and BIA students over the AY 2023/2024. The presentation helps students learn how to identify an industry-focused search for internships as well as jobs after graduation. They are shown tools and techniques to research an industry, develop targeted cover letters for their desired industry segment, and to identify what technologies and digital initiatives their target company is undertaking. This method allows students to be empowered to find more opportunities and improving the quality and effectiveness of their job search. |
| 3 | Through the Vice-Provost’s office, we utilized an external consulting firm to provide a competitive analysis of our MSIS program to other programs. The analysis was highly informative. Many of our competitors are offering 30-credit Information Systems degrees and we are considering what changes would be possible to our core and electives to bring our degree down to 30 or 31 credits and be completed in 1 calendar year. |
| 4 | Indirect Measurement  To improve our understanding of student perceptions and needs, we conducted our first detailed Exit Survey of all AY2023-24 graduating students. The results from this year’s survey have yet to be analyzed but are likely to yield a number of program innovations in the spirit of continuous improvement. Going forward, we intend to conduct this survey every year. |
| 5 | Continued focus on making our graduates “the total package,” with all the hard AND soft skills they need to succeed.  In January 2023, BCG and The Network surveyed over 90,000 respondents in a study titled “[What Job Seekers Wish They Knew](https://www.bcg.com/publications/2023/recruitment-recommendations-for-employers).” Two of the questions they asked were the following, (1) “How often are you approached with potential job opportunities?” and (2) “How do you perceive your negotiating position?” The most desirable situation is being approached often and having a strong negotiating position. According to BCG, the group in the most enviable position were people who had job roles required knowledge of (1) Business Mgmt., (2) Digitization, data science, and AI, (3) IT, and (4) Engineering and Technical focus. These are all the skills provided in the Stevens MSIS Program. BCG playfully gave this group the moniker of “Sexy and They Know IT.”   In 2022, Information Week’s IT Salary Report, titled “[A Shifting Job Market for Tech Talent](https://informationweek.tradepub.com/free/w_ingg06/prgm.cgi?a=1),” listed 21 Critical Business and Technical Skills. Of the 21 skills outlined, only 7 of the skills were technical skills. Fourteen, or double that number, were “soft skills” and “business skills.” The project oriented, industry focused, and business and digital leadership courses and experiences offered by the MSIS program are what the industry is asking for. |

TABLE 1: Electives Mapped to MSIS Specialization/Concentrations

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| --- | --- | --- | --- | --- | --- | --- |
|  | | | **Specializations** | | | |
| **Stevens MS in Information Systems  Elective Courses** | | **Credits** | **Business Intelligence & Analytics** | **Process Innovation & Service Mgmt.** | **Cyber Security** | **Project Management** |
| [BIA650](https://stevens.smartcatalogiq.com/2023-2024/academic-catalog/courses/bia-business-intelligence-and-analytics/600/bia-650/) | Process Optimization and Analytics | 3 | X | X |  | X |
| [BIA652](https://stevens.smartcatalogiq.com/2023-2024/academic-catalog/courses/bia-business-intelligence-and-analytics/600/bia-652/) | Multivariate Data Analytics | 3 | X |  |  |  |
| [BIA658](https://stevens.smartcatalogiq.com/en/2023-2024/academic-catalog/courses/bia-business-intelligence-and-analytics/600/bia-658/) | Social Network Analytics and Visualization | 3 | X |  |  |  |
| [BIA66](https://stevens.smartcatalogiq.com/en/2023-2024/academic-catalog/courses/bia-business-intelligence-and-analytics/600/bia-663/)3 | Augmented Intelligence  and Generative AI | 3 | X |  |  |  |
| [BIA668](https://stevens.smartcatalogiq.com/2023-2024/academic-catalog/courses/bia-business-intelligence-and-analytics/600/bia-668/) | Management of AI Technologies | 3 | X | X | X | X |
| [BIA670](https://stevens.smartcatalogiq.com/2023-2024/academic-catalog/courses/bia-business-intelligence-and-analytics/600/bia-670/) | Risk Management | 3 | X |  | X |  |
| [BIA67](https://stevens.smartcatalogiq.com/en/2023-2024/academic-catalog/courses/bia-business-intelligence-and-analytics/600/bia-672/)2 | Marketing Analytics | 3 | X |  |  |  |
| [BIA67](https://stevens.smartcatalogiq.com/en/2023-2024/academic-catalog/courses/bia-business-intelligence-and-analytics/600/bia-674/)4 | Supply Chain Analytics | 3 | X |  |  |  |
| [BIA678](https://stevens.smartcatalogiq.com/en/2023-2024/academic-catalog/courses/bia-business-intelligence-and-analytics/600/bia-678/) | Big Data Technologies | 3 | X |  |  |  |
| [FIN545](https://stevens.smartcatalogiq.com/2023-2024/academic-catalog/courses/fin-finance/500/fin-545/) | Financial Cybersecurity | 3 |  |  | X |  |
| [MIS635](https://stevens.smartcatalogiq.com/2023-2024/academic-catalog/courses/mis-information-systems/600/mis-635/) | Designing the Knowledge Organization | 3 | X |  |  |  |
| [MIS636](https://stevens.smartcatalogiq.com/2023-2024/academic-catalog/courses/mis-information-systems/600/mis-636/) | Data Integration for Business Intelligence and Analytics | 3 | X |  |  |  |
| [MIS645](https://stevens.smartcatalogiq.com/2023-2024/academic-catalog/courses/mis-information-systems/600/mis-645/) | Cybersecurity Principles for Managers | 3 |  |  | X |  |
| [MIS690](https://stevens.smartcatalogiq.com/2023-2024/academic-catalog/courses/mis-information-systems/600/mis-690/) | Supply Chain Management and Strategy | 3 | X | X |  |  |
| [MIS712](https://stevens.smartcatalogiq.com/2023-2024/academic-catalog/courses/mis-information-systems/700/mis-712/) | Advanced Business Process Management | 3 |  | X |  |  |
| [MIS714](https://stevens.smartcatalogiq.com/2023-2024/academic-catalog/courses/mis-information-systems/700/mis-714/) | Service Innovation | 3 |  | X |  |  |
| [MIS716](https://stevens.smartcatalogiq.com/2023-2024/academic-catalog/courses/mis-information-systems/700/mis-716/) | Blockchain Fundamentals and Application | 3 |  | X | X |  |
| [MIS720](https://stevens.smartcatalogiq.com/2023-2024/academic-catalog/courses/mis-information-systems/700/mis-720/) | Managing Enterprise Network Security Architectures | 3 |  |  | X |  |

# 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 an 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 graduating students, the majority of graduate management student respondents assessed, reported that their MSM experience somewhat or significantly improved their abilities (compared to their skills prior to starting their program) in relation to the program goals above and the competencies associated with them. Experiential aspects (assignments, projects, simulations, collaborative learning) of their education were reported to be most instrumental to students' skill development, although they also valued interaction with faculty and peers.  It should be noted, however, that due to low enrollments in this program, our sample size was 13.

**CURRICULUM CHANGES - Influenced by AOL**

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| **1** | Faculty have been provided guidance on adding AI-related content to courses. This includes creating learning assignments that utilize AI-generated content. (e.g. students use AI to assist them in the creation of personal mission and vision statements). Faculty have also been directed to have AI-related usage policies. Communication (goal 1), problem-solving skills (goal 4). |
| **2** | Learning modules emphasizing servant leadership and inclusive leadership have been added to Mgt 689 Organizational Behavior - communication (goal 1), teamwork (goal 2). |
| **3** | Although it is an extracurricular initiative, our inclusive leadership certificate program designed and delivered several student workshops that support goal 1 and goal 2. They include a workshop on cross-generational communication, improvisation principles and inclusion; and an inclusive scenarios/simulation workshop. The certificate is an additional credential beyond their degree. |

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

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| **1** | We are still in the process of considering whether or not to continue with our MSM in management program and we have made a strategic decision to downplay it in favor instead of our MBA program which is a more robust option for students seeking a graduate management degree. | | | | |
| **2** | We revised our course attendance policy (School-wide policy). Students can only miss two classes before there will be grade implications. | | | | |
| **3** | We expanded and revised the composition of our management program Advisory Board. This includes ensuring broader industry representation by adding representatives from MasterCard, Google, Pfizer, and BD. This includes the installation of a new Board chairperson from Google. | | | | |
| **4** | The Advisory Board formed subcommittees to provide guidance and recommendations for all graduate management programs. | | | | |
|  |  | | | | |
| MSM – 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* produces two copies of a 4-page essay that is 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 in their 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. When appropriate, instructors should give out samples of documents (both academic and professional) to model professional-level writing for all students. In several courses, however, we instead focus on providing detailed assignment outlines and encourage students to submit work for review prior to submitting their final versions    **Verbal Communication**:  Students easily met or exceeded expectations.    During the past year, our efforts to reduce overall class sizes helped provide students with more opportunity to speak in front of the class, to gain experience and confidence. Students are also encouraged to visit the Writing & Communication Center for extra help developing slides and practicing their oral delivery | |
| MSM – 2. Students can interact effectively in teams. | | Task Management    Relationship Management skills | Student groups in *MGT 699 Strategic Management* 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 bulk of students reached or exceeded expectations on both learning objectives. Still, the students will be advised to review the behavioral guidelines for facilitating-task and facilitating-relationship building behaviors (Robbins and Judge, Organizational Behavior, 18th Edition) at the start of 2023-2024. The material will also be provided as a pdf for the scholars. | |
| MSM - 3. Students will understand how a firm uses technology for competitive advantage in satisfying its business strategy. | | | ***MGT 671 Technology and Innovation Management*** | Every semester | All students in the course |  | |
| MSM - 4. Students will be able to effectively utilize analytic problem-solving skills. | | | ***EMT 715/MGT 699 Strategic Management*** | Every semester | All students in the course | There has been an increase from last year result (from 8.8 to 9.7) due to increases in all traits, mainly in traits 1 and 2. As usual, the caveat of limited generalizability of these scores due to the smaller sample (i.e. class size) should be kept in perspective, particularly with such a limited number of Students (3).  We have been working closely with each group before the final presentation to overcome problems related to strategy implementation separated from strategy formulation. Such trait (#3) has shown an increase from 8.8 to 9.3 (5.7%). | |

# 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 (MSTM/EMBA)**

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. The 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 graduating students, the majority of respondents assessed reported that their MSTM/EMBA experience somewhat or significantly improved their abilities (compared to their skills prior to starting their program) in relation to the program goals above and the competencies associated with them. Experiential aspects (assignments, projects, simulations, collaborative learning) of their education were reported to be most instrumental to students' skill development, although they also valued interaction with faculty and peers.  It should be noted, however, that due to low enrollments in this program, our sample size was 5.

**CURRICULUM CHANGES - Influenced by AOL**

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| **1** | We undertook a comprehensive revision of our MSTM/EMBA curriculum. This includes creating new:   * 3 credit course in marketing and technology that especially supports program goals 3 and 4; * 1.5 credit course in operations management that especially supports program goals 3 and 4; * 1.5 credit course in Business ethics, governance and sustainability that aligns with all four of our program goals |
| **2** | We added an existing course on cybersecurity principles to the curriculum in support of goals 3 and 4. |
| **3** | Faculty have been provided guidance on adding AI related content to courses. This includes creating learning assignments that utilize AI generated content. (e.g. students use AI to assist them in the creation of personal mission and vision statements). Faculty have also been directed to create AI related usage policies. communication (goal 1), using technology for competitive advantage (goal 3) |
| **4** | Although it is an extracurricular initiative, our inclusive leadership certificate program designed and delivered several student workshops that support goal 1 and goal 2. They include workshop on cross-generational communication, improvisation principles and inclusion; an inclusive scenarios/simulation workshop. The certificate is an additional credential beyond their degree. |

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

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| **1** | We commissioned an external market research firm to perform an analysis of the competitive landscape and market potential for Technology Management Master’s degree programs. |
| **2** | With significant funding support from the University’s Graduate School Enterprise, we undertook a substantial marketing campaign for the MSTM/EMBA program. This is the first such initiative for us in more than ten years. |
| **3** | We revised our course attendance policy (School-wide policy. In the context of the MSTM/EMBA program this means students can only miss 1 class session before there will be grade implications. |
| **4** | We expanded and revised the composition of our management program Advisory Board. This includes ensuring broader industry representation by adding representatives from MasterCard, Google, Pfizer, and BD. This includes the installation of a new Board chairperson from Google. |
| **5** | The Advisory Board formed subcommittees to provide guidance and recommendations for all graduate management programs. |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Goal | Competencies | Direct Measure | | Indirect Measure | | Outcome | |
| MSTM/EMBA – 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. | | Embedded in design assignment in all required courses.  ***EMT 635:*** ***Managerial Judgment & Decision Making*** is the course of assessment for written communication and ***EMT 696: Human-Centered Design Thinking*** is the course of assessment for the oral presentation. | | Self-Assessment of skills development | | **Written Communication**:  The majority of students in this program who participated in the writing assessment in Summer 2022 met or exceeded expectations. This is on par with how these students scored in previous assessments. Scores were generally consistent across the four Learning Goals, but there were slight increases in Goals 1 and 4, which rate the writer’s overall ability to convey their ideas in an orderly, logical way. Goals 2 and 3, which assess more word- and sentence-level writing issues, was slightly weaker, and is likely attributable to this being a very international cohort.    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. When appropriate, instructors should give out samples of documents (both academic and professional) to model professional-level writing for all students.  **Verbal Communication**:  Students in this program easily exceeded expectations in the ability to deliver effective presentations. Organization and logic were generally strong, and information was delivered in a way that was both clear and impactful. The use of smooth transitions and time management were also strong. Overall, areas relating to the speaker’s physical presence and voice quality were the weakest, but still effective. This is an element that can be taught but is only internalized by repeated exposure to public speaking. Slide creation was generally strong, but many presentations still suffered from cramped data and small text, which made it a bit hard on the audience. |
| MSTM/EMBA – 2. Inspire, motivate and lead teams and groups of technical professional and knowledge workers for maximum utilization of the organization’s human capital and continuous growth of its employees. | Competencies assessed include Self-awareness -Effectively uses all self-awareness dimensions-introspection, interaction and expansion to describe personal leadership qualities and aspirations.  Personal development planning – (self-regulation, self-management, learning agility) Uses self-management and self-regulation principles to articulate personal development objectives.  Interpersonal effectiveness (supportive communication; influencing, conflict management) | | 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. | | Survey of graduating students | | **Self-awareness -** This skill was well understood. (reflected in Skills Analysis papers and development plan reports.)  **Personal development** (self-regulation, self-management, learning agility) - These skills were well understood (reflected in development plan reports).  **Interpersonal effectiveness** (supportive communication; influencing, conflict management) - These skills were well understood (reflected in Skills Analysis papers development plan reports.)    This was another strong cohort. Although they were a small group, their backgrounds were varied. They were highly committed to their self-development work and were consistently well prepared for class. One benefit of the small class sizes is that we are able to provide each student with more coaching and developmental support as they engage in their self-reflection and subsequent development planning. As was the case last year, I will continue to focus on building in class course time for development planning work. It was helpful and enriched the quality of their development efforts and the way they applied course concepts. |

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| MSTM/EMBA - 3. Students will understand how a firm uses technology for competitive advantage in satisfying its business strategy. |  | Every semester | All students in the course |  |

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| --- | --- | --- | --- | --- | --- |
| Goal | Competencies | Direct Measure | Indirect Measure | | Outcome |
| MSTM/EMBA – 4. Identify, assess, launch, and lead organizational strategic initiatives in a technology-based environment for the creation of new business models in a large corporation including both sustaining and disruptive businesses. | Be able to develop a business model for a new product or service and understand the associated political and organizational constraints which are associated with gaining social and financial capital. This includes  1) Be able to gain support of the organization for a new product or service.  2) Be able to present a compelling business model innovation to a group of executives at the conclusion of the course. | This learning goal assessment takes place in course EMT 752: Corporate Entrepreneuring. Other courses are also involved in this assessment exercise:  EMT 741 Innovation Management Process, EMT 642: Marketing Management in Technical Organizations, and the final capstone course EMT 798: Integration & Application of Technology.    In EMT 752, students are challenged to propose a corporate entrepreneurship project in their company. They are assessed not only on the content of their proposals but also on whether they succeed in having their proposals implemented (see objective 2 trait 1). A high percentage of these proposals are actually funded. | | Survey of graduating students | All six students assessed met or exceeded expectations. The business model innovation process was generally followed, however further customer discovery was needed on several projects.We will **c**ontinue to work with students on how to develop and present a compelling business case.  This includes further explaining and working with students regarding the pitfalls of inadequate customer discovery and an inadequate analysis of the competitive landscape. |

# 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**

The Finance curriculum provides you with a rigorous study of the terminology, methods and application areas of economics, finance and financial technology. Classes will prepare you to apply technology for financial analysis, forecasting and management; assess the financial health of an organization; develop plans that address financial management needs of an organization; and lead business and technology teams.

**Core curriculum**

**Prerequisites**

Prerequisite courses are intended for students who do not have training or prior coursework in accounting, finance and statistics. Students who have passed the CFA level 1 exam are exempt from all prerequisites; students who have not passed the exam will work with their advisor to determine which courses they may waive.

* FIN 523 Financial Management
* FIN 500 Financial and Managerial Accounting
* BIA 652 Multivariate Data Analysis

A prerequisite course in business writing and communication also is required. This can be fulfilled through a MOOC.

**Economics core**

* FIN 616 Managerial Economics
* MGT 700 Econometrics

**Finance core**

* FIN 629 Fixed Income Analysis
* FIN 627 Investment Management
* FIN 638 Corporate Finance
* FIN 510 Financial Statement Analysis
* FIN 628 Derivatives

**Informational, Computational and Quantitative Core**

Choose any three of the following 1-credit lab courses.

* FE 511 Introduction to Bloomberg and Thomson Reuters
* FE 515 Introduction to R
* FE 517 Introduction to SAS
* FE 520 Introduction to Python

**Specialization**

A unique feature of this degree is the ability to customize the curriculum to best suit your career interests. Students can select from the concentrations below or, if desired, select four elective courses in any areas of their choosing, such as management science, financial engineering, mathematics, statistics and computer science.

**Investment Banking and Valuation**

Choose any four of the following courses.

* FIN 530 Investment Banking
* FIN 620 Advanced Financial Econometrics
* FIN 688 Mergers, Acquisitions and Other Corporate Restructuring
* FIN 526 Venture Capital and Private Equity
* FIN 648 International Finance
* FIN 540 Sustainable Finance

**Financial Analytics and Risk**

* FIN 620 Advanced Financial Econometrics
* FA 631 Investment, Portfolio Construction and Trading Analytics
* FA 636 Advanced Risk Analytics

You may also choose one of the following:

* BIA 656 Advanced Data Analytics and Machine Learning
* FE 590 Statistical Learning in Finance

**Wealth Management**

Choose any four of the following.

* FIN 620 Advanced Financial Econometrics
* FIN 658 Wealth Management Principles and Practices
* FIN 550 Financial Planning and Risk Management
* FA 631 Investment, Portfolio Construction and Trading Analytics
* FIN 555 Retirement and Estate Planning
* FIN 540 Sustainable Finance

**Certified Financial Planner**

* FIN 555 Retirement and Estate Planning
* FIN 550 Financial Planning and Risk Management
* FIN 565 Financial Plan Development
* FIN 560 Federal Taxation of Individuals

**Capstone experience**

The capstone consulting experience at Stevens ensure you are able to apply your new skills in tacking a real industry problem for a partner company. Working with a team of students, under the guidance of a faculty advisor, you'll meet with managers in the finance industry to frame a finance problem, then devise and present a formal solution to leadership. The capstone consists of two courses:

* MGT 808 Consulting Training Course (not for credit)
* MGT 809 Industry Capstone Experience

# CURRICULUM CHANGES - Influenced by AOL

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| **3** |  |
| **4** |  |

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

|  |  |
| --- | --- |
| 1 | Discussed FinTech concentration for the program |
| 2 | Created one credit course in prompt engineering |
| 3 | Proposal for 599 Independent Study |
| 4 | Proposal for Energy Finance (new course) |

# 10. 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.**

**INTRODUCTION AND OVERVIEW OF MS FINANCIAL ENGINEERING**

# CURRICULUM CHANGES - Influenced by AOL

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

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| 1 | Course FE514 was changed from VBA to Advanced Excel |
| 2 | Revised FE 529 to a course about deep learning |
| 3 | Differentiated FE543 and FE610’s course descriptions |
| 4 | Added more faculty to act as advisors to students |
| 5 | Began curriculum evaluation to determine of a re-vamp is necessary. Intended to be worked on through Summer of 2024 |

# 11. MS Financial Technology and Analytics (FTA) - Significant Changes Related to AoL Assessment

**INTRODUCTION AND OVERVIEW OF MS FINANCIAL TECHNOLOG AND ANALYTICS**

The MS in Financial Technology and Analytics program is designed for science, technology, engineering, and math (STEM) students who are pursuing careers in the financial industry. The program focuses on recent development in financial services from fundamental data processing to machine learning, decentralized finance, and fintech. Targeting on broader financial services and financial technology industry, program graduates are expected to be able to handle complex financial data, build advanced analytical models, deliver effective visualization product, and utilize cloud-based data-driven analytics technology.

# CURRICULUM CHANGES - Influenced by AOL

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

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| 1 | Created concentrations in data science and financial technology |
| 2 | Created one credit course in prompt engineering |
| 3 | Merged FIN 620 into FA 542 |
| 4 | Added more faculty to act as advisors to students |

**During each of the fall and spring semesters we organized an alumni meeting with all the current students and we used the opportunity to gather feedback about the program.**

# PHD Programs Significant Changes Related to AoL Assessment Process

**Doctor of Philosophy in Business Administration**

Key modifications to this program, guided by Assurance of Learning, encompass noteworthy alterations to its structure, incorporating adjustments prompted by input from the advisory board, alumni, market requirements, and other relevant factors.

**INTRODUCTION AND OVERVIEW OF DOCTOR OF BUSINESS ADMINISTRATION**

The Business Administration Ph.D. program at SSB prepares students to become diligent and reflective researchers who creatively apply technology and quantitative methods to develop innovative solutions and novel mathematical models for asset pricing, risk management, and portfolio optimization. This program focuses on three key research areas of the School of Business faculty: Finance, Information Systems and Analytics, and Entrepreneurship and Innovation Management. Graduates will be equipped to lead research endeavors in academia and institutions.

The program's Assurance of Learning (AOL) objectives reflect the school's commitment to empowering students to conduct advanced research and effectively communicate their findings to a broader audience. The curriculum is regularly updated to stay aligned with current research methodologies and practical applications. Students are encouraged to refine their public speaking skills and present their research at both internal and external seminars.

Program goals, as related to Assurance of Learning:

1. ***Goal 1****: Students excel in clearly articulating ideas through both written and spoken presentations and are proficient in organizing research papers.*
2. ***Goal 2****: Graduates of the Ph.D. program acquire expertise in fundamental knowledge and research methodologies pertinent to their primary area of study.*
3. ***Goal 3****: Ph.D. students demonstrate the ability to identify and develop dissertation research projects promptly and effectively disseminate knowledge through classroom teaching.*

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**CURRICULUM CHANGES - Influenced by AOL**

Based on data generated from AOL assessments and to enhance the Ph.D. program and better prepare students for successful research and teaching careers, the following initiatives and additions are proposed:

1. **Mandatory Brown Bag Seminar Series (*related to Goal 1)***: A brown bag seminar series will be instituted, requiring all doctoral students to present their research periodically. This initiative aims to improve students' presentation skills and their ability to communicate complex ideas clearly and concisely.
2. **Internal and External Doctoral Student Seminar Series (*related to Goal 1)***: We will establish a seminar series organized by doctoral students, inviting external doctoral students to participate. This platform will facilitate the dissemination of knowledge among affiliated peer groups and foster collaborative research opportunities.
3. **Ph.D. Research Showcase Day (*related to Goal 2)***: An annual Ph.D. Research Showcase Day will be introduced, providing doctoral students with the opportunity to present their research to faculty, peers, and external reviewers. This event is designed to elicit constructive feedback and enhance the quality of ongoing doctoral research.
4. **Additional Courses at the interface of Management and Technology (related to *Goal 3)***: In response to feedback from alumni groups and the advisory board, two new courses will be added to the curriculum:
   * History of Technology Evolution: This course will provide students with a broad understanding of the historical development of technology and its impact on business and society.
   * Management Organization Theory: This course will delve into advanced theories of management and organizational behavior, equipping students with a deeper understanding of how organizations operate and evolve.

These enhancements will ensure that our doctoral students are not only proficient researchers but also effective communicators and educators, fully prepared to lead and innovate in their respective fields.

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

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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.

**INTRODUCTION AND OVERVIEW OF PHD FE DEGREE**

The Financial Engineering Ph.D. program is a rigorous academic endeavor aimed at equipping students to embark on careers as future researchers within the realm of financial engineering and its interconnected fields. This program is a unique fusion of science and engineering principles situated within the context of a business school. Its distinctiveness lies in its focal point on cultivating students into pioneering researchers who approach the emerging challenges within the financial landscape with a profound problem-solving orientation.

Structured around six pivotal realms of research, the doctoral program delves into algorithmic and high-frequency trading, asset pricing and behavioral finance, portfolio optimization, systemic risk, mathematical finance, and financial analytics and innovation.

Beginning from 2017, the program has diligently embraced robust assurance of learning processes. This initiative has led to the establishment of three primary objectives:

Program goals, as related to Assurance of Learning:

1. ***Goal 1***. Ph.D. graduates can effectively communicate research in oral presentations.

1. ***Goal 2***. Ph.D. graduates will have sufficiently mastered the core knowledge and tools needed to conduct original research in a timely manner.
2. ***Goal 3***. Ph.D. graduates are able to effectively deliver academic courses in a university environment.

**CURRICULUM CHANGES - Influenced by AOL**

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| **1** | .To assess the AOL goal #1, we have introduced assessment forms during weekly Ph.D. research colloquium. FE Ph.D. students present their ongoing research during these sessions and their faculty advisors are invited to evaluate their oral communication of research, and fill out a form to score their performance in several aspects. |
| **2** | .In alignment with AOL goal #2, we have Ph.D. comprehensive exam that takes place at the beginning of their second year of study. The intension is to ascertain that the students have necessary subject knowledge to continue on the Ph.D. research. This is implemented to guarantee the students’ preparedness, enabling them to achieve their degree within the anticipated timeframe. |
| **3** | .In alignment with AOL goal #3, we have Ph.D. students who are in their final year to independently instruct at least one course. This is to enhance their teaching and communication abilities, and preparing them for forthcoming careers in academia. |
| **4** | In addition, we provide resources for students to present their research in local and international conferences. Participating in these academic events is particularly helpful for the students to establish academic connections and seek for academic jobs. |

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

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| 1 | Using AOL, we support and fund final-year PhD students to attend and present their research at significant conferences in their field. This serves as an indirect measure of their oral communication skills. Moreover, passing the qualification exam mandates PhD students to present at least once during the weekly PhD colloquium. We track and document the number of oral presentations delivered by each student. |
| 2 | Using AOL, we track the quantity of working papers, publications, and referred conference papers for qualified PhD students. Additionally, we gauge their progress indirectly by surveying the topics covered in the PhD colloquiums, which helps assess the extent of their knowledge and advancements. |

**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.

**INTRODUCTION AND OVERVIEW OF DOCTOR OF DATA SCIENCE**

The Doctor of Data Science program offers an advanced and comprehensive educational experience designed to equip students with the expertise and skills needed to excel in the rapidly evolving field of data science. This program is structured to provide a deep understanding of data analysis, interpretation, and utilization across diverse industries and domains.

Students enrolled in the Doctor of Data Science program will embark on an immersive journey of learning, research, and practical application. The curriculum encompasses a blend of rigorous coursework, hands-on projects, and collaborative research opportunities. By delving into topics such as machine learning, data mining, statistical analysis, and data visualization, students will gain a robust foundation in both foundational theories and cutting-edge techniques.

The program places a strong emphasis on research and innovation. Students will have the chance to work closely with esteemed faculty members who are leaders in the field of data science. This collaboration enables students to engage in groundbreaking research projects, contributing to the advancement of knowledge in areas such as predictive modeling, artificial intelligence, and big data analytics.

Furthermore, the Doctor of Data Science program fosters a dynamic learning environment through industry partnerships, guest lectures, and real-world projects. This exposure ensures that students are well-prepared to address complex challenges faced by industries today. Graduates of the program will possess the critical skills necessary to make data-driven decisions, transform businesses through insights, and drive innovation in a data-centric world.

**CURRICULUM CHANGES - Influenced by AOL**

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| **1** | Implemented termination and appeal policies for qualifying exams and structured interdisciplinary committee oversight for the Doctor of Data Science program. |
| **2** | Formalized comprehensive exams and oral communication assessments to ensure Ph.D. students’ readiness and communication skills. |
| **3** | Final-year Ph.D. students must teach a course and present at conferences to enhance teaching experience and academic networking. |