

**From:** [Smith, Randy](#)  
**To:** [Tomasko, David](#)  
**Cc:** [Sutherland, Sue](#); [Castro, Carlos](#); [Reed, Katie](#); [Smith, Randy](#); [Griffiths, Rob](#); [Greenbaum, Rob](#); [Duffy, Lisa](#); [Hunt, Ryan](#); [Quinzon-Bonello, Rosario](#); [Croxtton, Keely](#); [Chandrasekaran, Aravind](#)  
**Subject:** Proposal to revise the Integrated Business and Engineering Honors Program—Software Innovation Track  
**Date:** Friday, July 18, 2025 2:50:47 PM  
**Attachments:** [image001.png](#)

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David:

The proposal from the Fisher College of Business and the College of Engineering to revise the Integrated Business and Engineering Honors Program—Software Innovation Track was approved by the Council on Academic Affairs at its meeting on July 17, 2025. Thank you for attending the meeting to respond to questions/comments.

No additional level of internal review/approval is necessary. This action will be included in the Council's next [Annual Activities Report](#) to the University Senate (July 2025).

The Office of the University Registrar will work you on any implementation issues.

Please keep a copy of this message for your file on the proposal and I will do the same for the file in the Office of Academic Affairs.

If you have any questions please contact the Chair of the Council, Professor Sue Sutherland (.43), or me.

I wish you success with this important program development.

Randy



**W. Randy Smith, Ph.D.**

Vice Provost for Academic Programs

**Office of Academic Affairs**

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**Assisted by:**

**Katie Reed**

Executive Assistant

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## Memo

To: Randy Smith, Vice Provost for Academic Programs

From: Rosie Quinzon-Bonello, Assistant Dean for Curriculum and Assessment

Date: April 17, 2025

Re: Integrated Business and Engineering Program – Revision to Software Innovation Track

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Attached is a proposal submitted by the Integrated Business and Engineering BS degree program to revise the Software Innovation track.

Included in this proposal are approvals from

- the College of Engineering UG Honors Committee
- the Fisher College of Business Curriculum Committee


University Honors and Scholars was contacted via email soliciting feedback, which resulted in the question whether IBE students could receive credit for experiences such as global learning, community engaged learning, or leadership experiences. The response from the IBE program was that

- IBE experiential learning was “opt in” intended for professional development, recruitment, networking, and not necessarily aligned with learning objectives
- there was no current intention to offer program credit for these types of experience

The IBE program did not receive additional feedback from H&S after this response, so the request was made to proceed with the program change proposal.

This proposal was presented to CCAA on March 25, 2025, and unanimously approved.

Yours sincerely,

  
Rosie Quinzon-Bonello

**ATTN: Sandy Furterer, Chair of CCAA**

**RE:** Revision to Concentration Track Proposal | Integrated Business & Engineering – Software Innovation

**Executive Summary of Revisions:**

On behalf of the Integrated Business & Engineering (IBE) Honors program and faculty leadership team (Kristina Kennedy; ENGR & Michael Leiblein; BUS), we submit this revision to the original Integrated Business & Engineering Software Innovation (IBE-SI) track. These changes to the IBE-SI track have been reviewed and supported by administration in both colleges as well as partners in the Center for Software Innovation.

Changes include:

- (1) Further development of a rationale for the new SI track in the existing IBE program.
- (2) Change of the minor name from Computer Science Engineering to Computer Science.
- (3) Change in the SI track business curriculum from requiring 7 business courses (2 SI-specific courses plus 5 for the major/minor) to requiring 5 business courses (4 SI-specific courses that count towards the major/minor plus Accounting).
- (4) Change in the designation of the 4 new SI business courses to Honors designation.
- (5) Refinement of learning objectives for 4 new business courses.

Requesting approval for implementation from Autumn 2025.

**Transition Plan**

As the IBE Honors Program SI-track transitions to its updated curriculum starting AU25, we are committed to ensuring a smooth transition for students who began the program prior to this change and have completed coursework based on the prior curriculum.

Course Credit Transfer for Students in the Prior Curriculum:

Students who entered the IBE Honors Program before AU25 (pre-AU25) and completed courses under the previous curriculum will be allowed to apply these courses toward the updated degree requirements. These students will follow the updated academic trajectory, with courses from the prior curriculum counting toward their degree completion as they fulfill the updated program requirements.

Flexibility for Transitioning Students:

To support pre-AU25 students transitioning into the new curricular requirements, we will offer flexibility in course selection and sequencing by way of permitting prior non-honors minor course enrollment and/or the updated honors designated minor courses to be applicable towards program completion. This will allow students to complete the necessary requirements maintaining their academic progress. Advisors will work closely with students to ensure they have clear pathways to meet curricular program expectations without delay in their graduation timeline.

This plan aims to provide continuity and support for all students as they adapt to the updated curriculum, ensuring that each student has the opportunity to pursue and complete the program.

# **Revision to Concentration Track Proposal**

## **Integrated Business & Engineering – Software Innovation**

### **Proposal**

**Revised Track in the Integrated Business & Engineering (IBE) Honors Program entitled Software Innovation**

**June 5, 2023**

***Revised March 26, 2025***

**1. Name:** Revised Track in the IBE: Software Innovation

**Initial Start Date:** AU23

**Unit / College:** College of Engineering & Fisher College of Business

### **2. Rationale**

**Describe the rationale/purpose of the track.**

The proposed Software Innovation track in the Integrated Business & Engineering Honors program (IBE-SI) promises to prepare Ohio State University students to lead the world's software future. The need is urgent, as the growth in software products and services creates demand for a workforce skilled in software business and engineering. The U.S. software industry is projected to grow at a compound annual rate of 4.12% from 2024 to 2029.<sup>1</sup> Global growth is somewhat higher, with a projected compound annual growth rate of 5.01% over this period. Both numbers exceed typical labor market inflation levels, which historically fluctuate between 2% to 4%.<sup>2</sup>

Perhaps more importantly, the nature of the software industry creates distinct business and technical challenges that benefit by linking and integrating business and computer science engineering training. For example, adopting new digital solutions implies increasing vulnerability to cyber threats and challenges maintaining interoperability across multiple digital and analog systems. Both issues imply business challenges to coordinate change efforts. Implementing new "digital" software products and services implies significant initial costs in hardware and infrastructure upgrades that often lead to temporary declines in productivity.<sup>3</sup> At the same time, digital software products and services often create "network effects," leading to market concentration and atypical competitive dynamics. For instance, the development of software architectures or platforms that facilitate and govern matches between groups of buyers, sellers, and complementary providers creates different sources of competition (and regulatory concerns) than in "standard" competitive environments. Again, these changes imply a need to guide both economic and technological changes.

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<sup>1</sup> See <https://www.statista.com/outlook/tmo/software/united-states> (accessed 11/18/2024).

<sup>2</sup> [https://www.newyorkfed.org/medialibrary/media/research/staff\\_reports/sr1126.pdf?sc\\_lang=en](https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr1126.pdf?sc_lang=en)

<sup>3</sup> <https://www.brookings.edu/articles/how-digital-transformation-is-driving-economic-change/> (accessed 11/18/2024).

The software industry's unique challenges require skills not emphasized in many existing business or engineering programs. Thus, as noted in the business press, there are likely economic and career benefits to customizing education to include additional business expertise and coding skills (e.g., Korudki, 2023; Bogost, 2024).<sup>4</sup> On the business side of the program, this implies adapting and supplementing academically rigorous foundational courses in finance, management, marketing, operations, and strategy to help students develop the skills to deal with the unique challenges imposed in the software industry. A similar exercise will occur on the engineering side of the program with adaptations made to both the first-year IBE cornerstone project course as well as the new IBE-SI senior capstone course. Within these engineering IBE-SI courses, project prompts and technical content will be updated to reflect software applications.

The revised program will substantively benefit from an affiliation with the new Center for Software Innovation (funded by the \$110M gift from the Timashev Family Foundation). The proposed IBE-SI track will serve as the pilot academic arm of the Center and exist as a multi-modal cross-college interdisciplinary program for undergraduate students to gain critical business and computer science skills. Moreover, the partnership with the Center will support hiring new faculty in both the Fisher College of Business and the College of Engineering to engage with IBE-SI students and the Center for Software Innovation.

Beyond the core of classroom learning, the partnership with the Center for Software Innovation will provide students with co-curricular and extra-curricular opportunities. These opportunities include internships and exposure to industry leaders and entrepreneurs, enabling Ohio State to prepare students for careers in this space. Additionally, through the Timashev Family Foundation gift, the program will have access to programmatic funding to offer experiential learning opportunities and potentially scholarships. Beyond mere cohort experiences, the combination of rigorous academic courses and pragmatic and powerful interactions with practitioners promises to foster a dialectic between the deep insights provided by academic frameworks and the realities highlighted by practitioners.

The Fisher College of Business and the College of Engineering will lead the program development for the IBE-SI track in collaboration with the Center for Software Innovation. The course directors will model the curriculum from the successful Integrated Business & Engineering (IBE) honors program (see <https://engineering.osu.edu/integrated-business-engineering-honors-program> and <https://fisher.osu.edu/undergraduate/academics/honors/ibe>).

### **Describe how assessment data has served as an impetus for the proposal.**

This proposal draws on application and enrollment data from the Integrated Business & Engineering (IBE) Honors program. The IBE program has generated significant demand since its formation in 2014—averaging about 200 applications annually from students already accepted into the honors programs from these colleges. The composition of existing applications is noteworthy—several students indicate they are applying to Ohio State because of the IBE program. This new IBE-SI track will draw from the

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<sup>4</sup> See Korudki (2023). So Much for 'Learn to Code.' The Atlantic. September 26, 2023. See Bogost (2024). Universities have a computer science problem. March 19, 2024.

honors business and engineering applicant pool. Like the IBE program, it may also attract additional student applications.

Industry partners have responded to the IBE program by vigorously recruiting IBE graduates. The program directors are unaware of an IBE graduate without an offer of employment at the time of graduation. Since the program's inception, the starting salaries of IBE students have been 10-25% higher than the starting salaries of the general business or engineering student population and (in the only year where data is available) higher than every established honors program in the college except for the Fisher Futures program.

The historical outcomes from the core IBE program suggest OSU will be able to attract students to fill the IBE-SI program at a maximum student capacity of 36. In addition to the rigorous academic content, the Timashev Foundation funding will provide experiential learning to supplement course work, and the meaningful extra-curricular programs associated with the program will enhance the career prospects of IBE-SI graduates seeking to enter the workforce.

**Identify any unique characteristics or resources that make it particularly appropriate for Ohio State to offer the proposed new track.**

Modeled after one of Ohio State's most innovative programs, The Integrated Business & Engineering (IBE) Honors program, the IBE-SI track will leverage the existing course structure and faculty leads to deliver an excellent educational experience.

The OSU IBE program was designed to provide students with "exposure to prominent business and engineering problem formulation and solution frameworks as well as experience applying these frameworks in multidisciplinary teams" (OSU IBE Honors proposal, 2014). The program recognized the need for individuals capable of devising economically and technologically sound solutions to real-world problems, identified differences in the types of problems addressed by the business and engineering fields,<sup>5</sup> and proposed a balanced program of study that provided exposure to foundational facts and frameworks alongside the capabilities and skills of practice. The IBE program fosters interdisciplinary learning across the business and engineering disciplines, as well as across academics and practitioners.

The proposed IBE-SI program curriculum emphasizes an interdisciplinary course sequence focusing on the software industry. The Fisher College of Business will provide rigorous finance, management, marketing, and operations courses. After carefully reviewing and pruning topics in these courses, the college has outlined courses that will cover foundational topics in each functional area and topics customized to address primary challenges posed in the software industry. For example, in addition to foundational issues in finance, the course will include emerging issues in digital and entrepreneurial finance. In addition to foundational issues in culture, decision-making, and leadership, the management course will build on an existing MBA elective that addresses topics associated with the design of software platforms and the competitive implications of these decisions. In addition to foundational

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<sup>5</sup> Business problems may be defined as ambiguous and ill-defined with "fuzzy" choice sets and unclear decision criteria. This leads to a search for coherent solutions using math and human agency. By contrast, many engineering problems may be complex but tend to be well-specified with clear decision criteria. This leads to a search for precise solutions using math and optimization.

marketing topics such as consumer behavior and the selection of marketing mix components (advertising, channels, product, pricing, etc.), the customized portion of the course will address topics such as pricing models in software, digital marketing campaigns in software, and customer feedback and sales enablement tools in software. In addition to foundational operations topics such as capacity planning, inventory management, and constraint/lean management principles, the operations course will include topics such as supply chain issues in the digital environment, tools for managing the new product development process (e.g., stage gate, agile, and waterfall processes), and prototyping and forecasting best practices.

On the engineering side, the IBE-SI students will be supported by dedicated faculty to teach the first-year IBE-SI cornerstone project course as well as the new IBE-SI senior capstone. Additional support through industrial connections and mentorship is being provided by the new Center for Software Innovation.

The academic content from the Colleges of Business and Engineering will be supplemented with co- and extra-curricular experiential learning, internships, professional development, and networking activities. The objective of these activities is three-fold. One objective is to allow students to gain experience applying the rigorous academic frameworks and tools from their coursework. A second objective is to enable students to question the assumptions underlying these frameworks and tools—often by working with clinical faculty familiar with the assumptions and techniques of practice. A third objective is to create co- and extra-curricular activities that help students build camaraderie as well as attitudes, beliefs, and values associated with integrity.

**Cite the benefits for students, the institution, and the region or state.**

Ohio State is one of a few universities that offer this type of interdisciplinary educational programming. The University of California Berkeley (since 2017), Georgia Tech (unknown initial year), the University of Illinois (since 2017), Lehigh (since 1998), and Purdue (since 2021) offer similar “integrated business and engineering” programs.<sup>6</sup> This program raises Ohio State's visibility among companies looking for talent in this region and/or looking to establish operations in Ohio.

### **3. Relationship to Other Programs / Benchmarking**

**Describe current major and minor programs in the department(s) and how they relate to the proposed track.**

The nearest comparable offerings for students are the IBE-Core track where Engineering Majors can pursue a Business Minor and Business Majors can pursue an Engineering Sciences minor. Another comparable offering is for Engineering majors to independently pursue a Business minor and Business majors to independently pursue a Computer Science minor. However, these paths do not offer the

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<sup>6</sup> The University of Pennsylvania reports a program started in 1977, Rensselaer Polytechnic Institute reports a program started in 1987 (with ties to the 1930s), MIT reports a program starting in 1988, and Stanford reports a program starting in 2009.

customized academic content, extracurricular opportunities, networking, professional development opportunities, or the cohort model (small class sizes, etc.) provided by the IBE-Core and IBE-SI tracks.

**Identify any overlaps with other programs or departments within the university. Append letters of concurrence or objection from related units.**

None.

**Indicate whether this track within the IBE program was submitted for approval previously. Explain at what stage and why that proposal was not approved or was withdrawn.**

This proposal for the IBE Software Innovation program was first submitted and approved by OAA in Summer 2023.

#### **4. Student Enrollment**

**Indicate the number of students you anticipate will take this track.**

There are good reasons to believe that the IBE-SI track will fill a complete honors cohort of **36 students per year**, with roughly half from the College of Business and half from the College of Engineering. This expectation is based on demand for the existing IBE-Core program and the overwhelming interest in computer science and software-related majors. In addition, the IBE program attracted and accepted 36 additional IBE incoming first-year students (72 students total) for the 2023 and 2024 Autumn terms. These additional students will be transferred into the IBE-SI track upon approval.

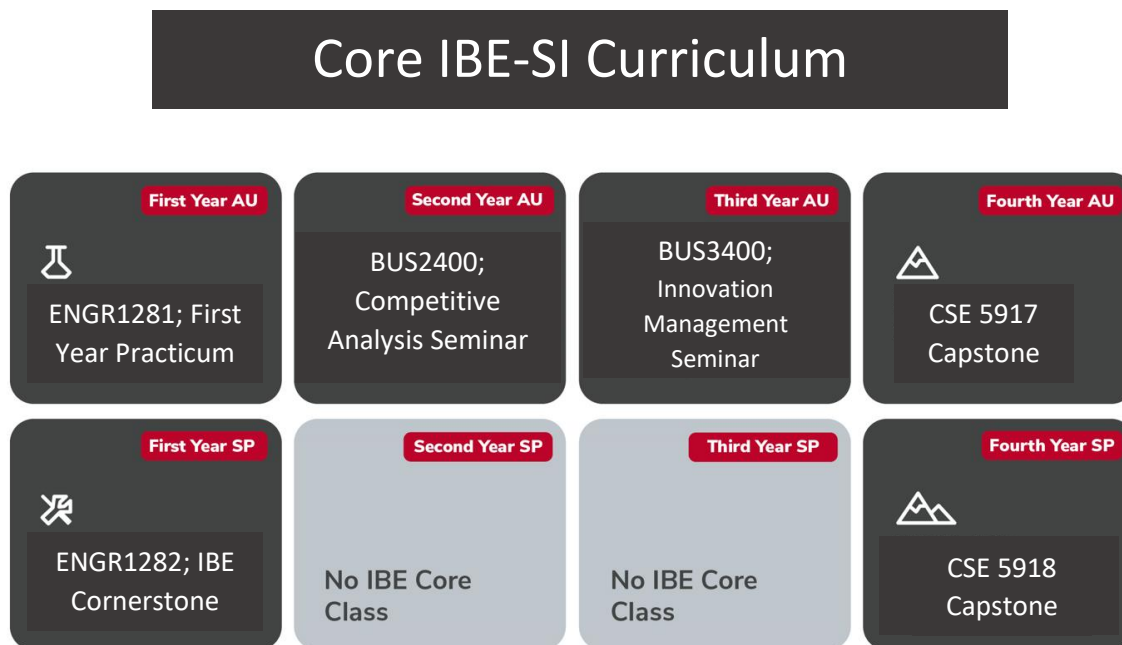
If approved, admission to the IBE-Core and IBE-SI tracks will occur using the following process. Students admitted to the Honors programs in the OSU College of Business or Engineering will be invited to apply to the IBE program. Students will be asked to state a preference for admission to the IBE-Core or the IBE-SI track. Applicants will also be asked to respond to several prompts to indicate their leadership experience, interest in IBE-SI (or IBE-Core), and potential contributions to the IBE-SI or IBE-Core cohort. Application materials are reviewed and scored. Top applicants will be offered admission, and a waitlist will be maintained. The program directors will aim to fill each track with equal numbers of business and engineering students; however, the IBE program has historically received greater interest from engineering majors than business majors. Since its inception, the IBE program has included at least 12 business students (33% of all admissions) in each cohort.

#### **5. Curricular Requirements**

As with the IBE-Core program, IBE-SI students will pursue the honors program alongside each college's traditional business and engineering majors. The IBE-SI students will pursue a core honors course sequence, as shown in Figure 1 and described below. All core courses in Figure 1 and Section 1 are taken together as a cohort. No changes to the learning outcomes in these courses are proposed, but the topics used to attain the outcomes will be tailored to each track; for example, company-sponsored projects for



the new IBE-SI Capstone will be primarily sourced from software companies. The capstone courses for IBE-SI will be developed as honors versions of the CSE capstone design (proposed as CSE 5917H and CSE 5918H) instead of ENGR 5901.02H for the regular IBE track and will be co-taught by business and engineering faculty.



**Figure 1.** Core IBE Curriculum Structure.

- (1) Six IBE core courses: ENGR 1281H (First-Year Engineering Practicum), ENGR 1282H (IBE Cornerstone), BUSMHR 2400H (Competitive Strategy Seminar), BUSMHR 3400H (Technology Strategy & Innovation Management Seminar), ENGR-CSE 5917H/5918H (Two-Semester Honors Computer Science & Engineering Senior Capstone) with credit hours as noted:
  - a. ENGR 1281.01H First-Year Engineering Honors; 5 credit hours
  - b. ENGR 1282.03H IBE Cornerstone; 3 credit hours
  - c. BUSMHR 2400H; 1 credit hour (2 hours)
  - d. BUSMHR 3400H; 1 credit hour (2 hours)
  - e. CSE 5917H IBE-SI Capstone; 3 credit hours, co-taught
  - f. CSE 5918H IBE-SI Capstone; 3 credit hours, co-taught

For engineering students, the first-year and capstone courses overlap with the curricular requirements of their major.

The fundamental curricular changes are within the *minor course offerings*, as noted in Sections 2-4. All courses are 3-credit hour courses unless otherwise noted. The business courses for the SI track are new offerings. (For reference, BUSFIN is Business Finance, BUSMHR is Business Management, BUSML is Business Marketing & Logistics, BUSOBA is Business Operations & Business Analytics, ENGR CSE is Engineering Computer Science Engineering.)

#### (1) IBE-SI Business Majors

- a. Seven required courses:
  - i. (4) from Business: BUSFIN 3220H\* Business Finance, BUSMHR 3200H\* Platform Management, BUSOBA 3230H\* Principles of Operations and Product Development, BUSML 4242H- The Strategy and Tactics of Software Marketing.<sup>7</sup> Note: All 4 will substitute for courses in their business core.
  - ii. (3) from Engineering: ENGR CSE2122 Programing (Data Structures) or ENGR CSE 2123 Programming (Data Structures; Java Based), and ENGR CSE 2321 Algorithms, and ENGR CSE 3430 Systems 1.5 (4 credit hours).
    1. Students on this track will earn a Computer Science minor using the 3 CSE courses above as well as CSE 5917H and CSE 5918H from the IBE-SI core requirements to complete the CS minor requirements.

## (2) IBE-SI Engineering Majors

- a. Five required courses: AMIS 2000 Foundations of Accounting, BUSFIN 3220H\* Business Finance, BUSMHR 3200H\* Platform Management, BUSOBA 3230H\* Principles of Operations and Product Development, BUSML 4242H- The Strategy and Tactics of Software Marketing.

Upon completing these requirements along with those of their BS degree program, students graduate with “Honors in Integrated Business and Engineering” on their diploma and either a minor in Business or a minor in Computer Science.

## 6. Honors Requirements

The new IBE-SI track will meet the updated Honors Program Standards in the following ways:

- (1) Offer the standard ***First-Year Survey with Honors Modules*** in addition to a student-led-student-run IBE First-Year Development Program (FDP) offered each Autumn semester. The FDP intends to introduce the extent and opportunities of IBE to incoming first-year students. This program is outside of class and voluntary but supplements the traditional survey course as it offers a near-peer mentor experience for students.
- (2) ***18 credit hours of Honors quality courses are required.*** Many of these credits are obtained via the “IBE-SI Core Courses” including ENGR 1281H (5 cr), ENGR 1282H (3 cr), BUS 2400H (1 cr), BUS 3400H (1 cr), ENGR 5917H (3 cr), ENGR 5918H (3cr) for a total of 16 honors credits. In addition, all four business courses will be Honors courses for an additional 12 credit hours.
- (3) Experiential learning via the new IBE Treks (company- or alumni-sponsored visits to explore career paths or sponsored team case study competitions), internships, and co-ops will be offered for students to opt in to support their ***ePortfolio requirement***.
- (4) ***Honors Reflection*** will be achieved via the mandatory 5917H / 5918H 2-semester IBE CSE Honors Capstone sequence. In this course, students work in teams on company sponsored real-world projects to solve problems, discovery opportunity and create value. The course leverages

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<sup>7</sup> The asterisks indicate that these courses will be new. The current course numbers reflect the courses they are based on, but new courses will be developed for this program. Each will be an enhanced version of the business core courses with additional content focused on the software context.

previous coursework, IBE Trek experiences, along with internships and co-ops and personal experiences.

## **Appendix: Description of Four New Business Courses**

**BUSFIN 3220H:** Finance proposes a three-part course. The first part includes classic financial topics like capital budgeting, building proforma projections, and risk. For example, in addition to foundational issues in finance, the course will include emerging issues in digital and entrepreneurial finance.

**BUSMHR 3200H:** Management proposes a three-part course. The first part addresses classic topics in organizational behavior, including decision-making. The second part builds on an existing MBA course to describe competition in the digital economy (e.g., the design and management of platform business models and how these models affect competition). The third part returns to classic organizational behavior and human resource issues such as culture, leadership, and morale in a digital context.

**BUSML 4242H- The Strategy and Tactics of Software Marketing:** Marketing proposes a software marketing course. This course will address foundational marketing and customized digital market topics. The foundational marketing topics include consumer behavior, selection of marketing mix components (advertising, channels, product, pricing, etc.), and customization to the digital context. The customized portion of the course will address topics such as pricing models in software, digital marketing campaigns in software, and customer feedback and sales enablement tools in software.

**BUSOBA 3230H:** Operations proposes an operations principles and product development course. This course will address foundational operations and product development topics customized to the digital environment. The foundational topics include quality management, capacity planning, inventory management, and constraint/lean management principles. The product development in the digital environment component includes types of digital innovations, collaboration, and supply chain issues in the digital environment, tools for managing the new product development process (e.g., stage gate, agile, and waterfall processes), and prototyping and forecasting best practices.



## Memo

Date: March 3, 2025

Re: Revisions to the Concentration Track: Integrated Business and Engineering – Software Innovation

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On February 25, 2025, the College of Engineering Undergraduate Honors Committee approved the following revisions to the concentration track: Integrated Business and Engineering – Software Innovation (IBE-SI) program:

1. Development of a rationale for a new track in the existing IBE program.
2. Change of the minor name from Computer Science Engineering to Computer Science.
3. Change in the business curriculum from requiring 7 business courses (2 SI-specific courses plus 5 for the major/minor) to requiring 5 business courses (4 SI-specific courses that count towards the major/minor plus Accounting).
4. Change in the designation of the 4 new business courses to Honors designation.
5. Refinement of learning objectives for 4 new business courses.

The rationale, revision details (current and proposed), and impact on current and future students are provided in the attached proposal.

Yours sincerely,

Michael Knisley

**From:** [Croxton, Keely](#)  
**To:** [Kennedy, Kristina](#); [Quinzon-Bonello, Rosario](#)  
**Subject:** Re: Integrated Business & Engineering Honors Software Innovation (IBE-SI) Program | Updated Proposal for Review  
**Date:** Monday, April 14, 2025 9:56:35 AM

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Rosie,

Yes, Fisher's Undergraduate Curriculum Committee approved the updated IBE-SI Program proposal. Let me know if you need anything else!

Keely



**Keely L. Croxton, PhD**  
Prof. of Logistics  
Associate Dean of Academic Programs  
Fisher College of Business  
[croxton.4@osu.edu](mailto:croxton.4@osu.edu)

HATE  
HAS NO  
BUSINESS  
HERE.