Rice University

Proposal for Minor in Entrepreneurship

Approved by the Faculty Senate

April 22, 2020
Proposal for an Entrepreneurship Minor

For submission to
The Faculty Senate
Rice University

April 6, 2020
Table of Contents

Overview of the Entrepreneurship Minor ........................................................................................................ 3
State of the Field .................................................................................................................................................. 3
Cumulative Learning and a Capstone Project ....................................................................................................... 4
The Liu Idea Lab for Innovation and Entrepreneurship .................................................................................... 6
Proposed Scope of the Entrepreneurship Minor ................................................................................................ 6
Relationship between the Entrepreneurship Minor and other degree programs .............................................. 7
Student Learning Outcomes for the Entrepreneurship Minor ........................................................................ 8
An Integrated Course of Study .......................................................................................................................... 8
Assessment Plan ................................................................................................................................................ 10
Capstone Assessment ....................................................................................................................................... 12
Minor Management and Administration ............................................................................................................. 13
Other Required Elements ................................................................................................................................ 13
Answers to Anticipated Questions ..................................................................................................................... 14
   How is the entrepreneurship minor distinct from the business minor? Why do we need a separate minor? .................................................................................................................................................. 14
   Who is likely to take this minor? ....................................................................................................................... 14
   Are there too many non-tenure track faculty involved in this minor? ......................................................... 15
   Who has the intellectual and academic management of the minor? .............................................................. 15
   How will busy Rice students have time to take this minor? Is there an audience for this minor? .............. 15
   Do students need to have an idea for an entrepreneurial project to take the courses in the minor? .......... 16
   Is the curriculum appropriate as a Minor or better framed as a Certificate? .............................................. 16
   Will engineering and natural science students who take the major have time to take a second capstone? .. 17
   Will there be continued funding and support for Lilie and the minor? ......................................................... 18
   Is there sufficient breath of electives in the proposed minor? ...................................................................... 18
   Will there be sufficient space in the capstone courses to accommodate all students interested in the minor? ........................................................................................................................................... 19
Appendix A: Course Descriptions and Faculty ................................................................................................. 19
Appendix B: Draft Letters of Support ................................................................................................................ 24
Appendix C: Proposed Language for General Announcements .................................................................... 25
Appendix D: Course Name Changes .................................................................................................................. 30
Appendix E: Minors at Other Institutions ....................................................................................................... 31
Proposal for the Entrepreneurship Minor

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Overview of the Entrepreneurship Minor

Over the past several years, Rice has been carefully cultivating meaningful resources in the domain of entrepreneurship education. This proposal puts forth the structure and support for a Minor course of study in Entrepreneurship that brings together a broad collection of varying disciplinary elements that allow rice student to master a core body of knowledge around the theory and practice of entrepreneurship and innovation, obtaining an overview of a subject that is different than their major course of study. The content of the proposed minor program focuses on theory as well as practice, and is built on the back of extensive research in the area of entrepreneurship over the last two decades. The structure of the minor is based on a breadth of different disciplinary components and theory/frameworks taught at different levels, tied together by a capstone course.

The courses developed and proposed for the Entrepreneurship Minor provide Rice students with a pathway to pursue rigorous and interdisciplinary study in the field of innovation and entrepreneurship, enabling students to understand the theory and frameworks behind different disciplinary aspects of entrepreneurship and how to apply these theories to develop and scale innovative solutions to societal problems. The entrepreneurial curricular offerings offer students exposure to a discipline that differs from their major departmental studies, and allows them to study the mindset and process of entrepreneurship and entrepreneurial activity in interdisciplinary settings. The courses in the proposed minor are strategically designed and delivered to afford students the space to foster new ideas and creativity through curricular offerings which have been carefully crafted to ensure they are providing value to students over and above the current departmental and program offerings at Rice. The body of the major (i) includes breadth; (ii) addresses knowledge gaps; (iii) adds experiential components at different levels; and (iv) ties all elements together through the capstone.

Entrepreneurship in nature is an interdisciplinary enquiry, so the minor necessitates the incorporation of theory, contexts, and methods from across existing disciplines at Rice. The entrepreneurial curricular offerings—which are distinct from what is offered in traditional business courses and in the undergraduate business minor—have been met with lively student demand. As part of a natural next step, we propose to organize these undergraduate courses as a coherent learning pathway in the form of a new minor in Entrepreneurship at Rice.

State of the Field

When entrepreneurship course first began being offered at universities many decades ago, there was little academic research off of which to base their content, and most universities who incorporated entrepreneurship into their curriculum did so by have one-off adjunct faculty with no academic background come in and essentially “tell stories” about their entrepreneurial experiences. While this image
of entrepreneurship education still persists in some people’s minds, it does not reflect the evolution of the field into a rigorous, theory-based discipline supporting tenure track research faculty and teaching a broad set of research-driven tools and frameworks drawing from a wide set of disciplines across the management sciences. No longer do top tier universities teach a course titled “Entrepreneurship”—today, the typical entrepreneurship program at an R1 university teaches a range of courses each focused on a different aspect of the entrepreneurial process and rooted in theory from fields such as psychology, sociology, and economics.

Over the last two decades, Entrepreneurship has evolved into a legitimate academic discipline with a large and substantial body of peer-reviewed knowledge, both theoretical and applied. This evolution has been supported by the creation of new academic research departments at major universities (Harvard Business School, MIT Sloan, U Penn Wharton School, Washington University St. Louis School of Management, Stanford Engineering – to name just a few) and the extensive recruiting of tenure track faculty focused specifically on research in Entrepreneurship in various management-related departments at other peer schools (such as Cornell, Northwestern, Caltech, USC, UC Berkeley, Carnegie Mellon, etc.). It is codified in the formation of a formal Program of Researchers in Productivity, Innovation and Entrepreneurship at the National Bureau of Academic Research (NBER) and several additional Researcher Working Groups on subfields of entrepreneurship at the NBER. There are dozens of academic research conferences in entrepreneurship each year at top research institutions across the United States, and across the world, each featuring cutting edge, world class peer reviewed research work that serves to expand the boundaries of the field. The proposed minor was designed in large part by Prof. Yael Hochberg of the Jones Graduate School of Business at Rice University, who is a member of the NBER and serves on the steering committee for its research program in Productivity, Innovation and Entrepreneurship.

In response to the development of the academic discipline in the field, many of Rice’s national counterparts have already introduced entrepreneurship as a minor or major field of study for undergraduates, including but not limited to: MIT, Northwestern University, John Hopkins University, Cornell University, Columbia University, and University of Texas. Rice positions itself at the forefront of these efforts through a multi-school collaboration including the Schools of Business and Engineering.

Appendix E provides descriptions of three such peer institution minors in entrepreneurship that are most similar to our proposed offering; others are available upon request. These descriptions serve to benchmark this current proposal against institutions of similar rank and academic rigor, who have seen it fit to formalize a field of academic study. More generally, entrepreneurship courses have become an object de rigueur for most R1 universities. While some universities still persist in teaching applied courses using adjunct faculty and without incorporation of research-based theory and frameworks, the general movement is increasingly towards a revamping of entrepreneurial education to reflect research-based learning and to place emphasis on both theory and practicalities of entrepreneurial process and mindset.

**Cumulative Learning and a Capstone Project**

At the heart of entrepreneurship education is the entrepreneurial process and mindset. This structured process has its origins in decades of research exploring the process for commercialization of new technologies and the launching of new ventures. The process includes identifying an unmet user and customer need, articulating a value proposition, developing a strategy to bring new concepts to market,
designing a sustainable business model, assessing market traction, communicating a vision to key stakeholders, and building and managing appropriate teams. The process involves the mastery of theory-driven skills and competencies, and, as in engineering and the sciences, the practical application of these theories.

While the minor curriculum is based in peer-reviewed academic theory, in keeping with best practices in teaching and learning across diverse domains, the minor teaches students not only the “equations” of entrepreneurship, but also the application of such “equations” in real world settings. This is in line with Rice’s national leadership in project-based and experiential learning, as evidenced through the successes of, e.g., the Oshman Engineering Design Kitchen (OEDK), the Medical Media Arts Lab, Global Health Technologies, Social Science Practica, and others.

In the curriculum proposed here, students learn theory, mindset, and a broad set of competencies in the classroom; they then tie together and apply this knowledge in a capstone project. An example of a recent venture that students have moved from classroom learnings to capstone project through Lilie entrepreneurship courses such as BUSI 221 New Enterprises (introductory course) and BUSI 469 Lilie New Venture Challenge (capstone course) is Cherrypick, which uses machine learning and computer vision to assist tennis coaches in reviewing match data to make better coaching decisions. The Cherrypick team took introductory classes and then applied the tools and frameworks in a capstone class, working on their own startup venture. Another example of a capstone experience is BUSI 464 Social Entrepreneurship, where students work on projects in concert with community organizations on projects of social concern; recent work has focused on the urban food desert. The project-driven learning at the heart of the minor enables students to engage in sustained interaction with stakeholders beyond the hedges, in the spirit of Rice’s commitments more broadly.

The minor is comprised primarily of courses which currently exist at Rice (only 1.0 credit of new courses is proposed, a Communication for Entrepreneurs lab course). The minor organizes these courses into a coherent pathway for students. After taking foundational courses, which include both quantitative and qualitative studies, students select elective courses and a capstone track through which they will demonstrate their mastery in a final capstone project to be completed in the final year of study. The capstone project requires that students tie together the elements from the foundational and elective courses and demonstrate mastery of their chosen area of focus, i.e. either new ventures, evaluating and financing early-stage ventures, or social entrepreneurship.

The capstone projects will enable students to demonstrate successful completion of the learning outcomes. In the capstone project for those who choose to develop a new venture, students will advance their own novel venture idea through customer discovery, business model development, financial model evaluation, testing key assumptions, and pitching their venture. For those who focus on evaluating and financing early-stage ventures, students will assess at least three startup ventures, complete deep due diligence on at least one venture, make an investment recommendation to an investment committee based on their due diligence, and create recommended investment deal terms. Students focusing on social entrepreneurship will develop an understanding of stakeholder needs through application of user-centered design thinking principles; assess the complex needs of a broad array of stakeholders and influencers, including the public sector; develop solutions that respond to stakeholder needs; develop models that deliver both financial

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1 The Social Science Practica are faculty-led experiential learning courses in health, law, consulting, and finance.
and social outcomes, and successfully present persuasive arguments in support of their concept/final project.

The Liu Idea Lab for Innovation and Entrepreneurship

The launch of the new campus-wide multidisciplinary hub and physical co-working space, the Liu Idea Lab for Innovation and Entrepreneurship (Lilie), serves as a fitting home for the minor. As proposed, the curricular core is primarily taught by faculty affiliated with and sponsored by Lilie. The Liu Idea Lab for Innovation and Entrepreneurship (Lilie) opened on the ground floor of the Cambridge Office Building (COB) in 2017. The purpose of Lilie was to establish a home base from which to curate curricular and co-curricular resources to support student learning in entrepreneurship. Over the past three years, Lilie has provided courses as well as a range of co-curricular resources including workshops, mentor and alumni networks, expert speakers, internships, and small group activities. Demand for these resources from students across campus has been strong, and with continued evidence of success, Lilie has recently expanded in full-time staff and faculty who are positioned to lead and administer the curricular program now and in the years to come. Lilie staff and faculty are wholly funded by a twenty year gift that includes an endowment component to ensure funding after the end of the gift term. This gift ensures that Lilie will be able to continue supporting the courses that underlie this minor for decades to come.

Exhibit 1: Enrollment numbers from 2017-2020:

<table>
<thead>
<tr>
<th>Course Description</th>
<th>2017-2018</th>
<th>2018-2019</th>
<th>2019-2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSI 220: Lilie Design Thinking</td>
<td>21</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>BUSI 221/ENGI 221: New Enterprises</td>
<td>13</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>BUSI 223: Business and Financial Modeling for Entrepreneurs</td>
<td>27</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>BUSI 461: Financing the Startup Venture</td>
<td>.</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>BUSI 463: Entrepreneurial Strategy and Founders Dilemmas</td>
<td>.</td>
<td>24</td>
<td>62</td>
</tr>
<tr>
<td>BUSI 464: Social Entrepreneurship (capstone)</td>
<td>32</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>BUSI 465: Student Venture Fund (capstone)</td>
<td>.</td>
<td>.</td>
<td>16</td>
</tr>
<tr>
<td>BUSI 469: New Venture Challenge (capstone)</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Proposed Scope of the Entrepreneurship Minor

The proposed scope of the new minor will include four core classes. A sample schedule for a student is as follows. In either their first year or second year, students will enroll in the introductory course, “Lilie Design Thinking,” BUSI 220. In their second year, students will enroll in “New Enterprises, 2nd” BUSI 221, and “Modeling for Entrepreneurs,” BUSI 223. In their third year, students will enroll in “Entrepreneurial Strategy,” BUSI 463. In the final year, students will complete a Capstone project in one of three classes, “Lilie New Venture Challenge;”

\[\text{\textsuperscript{3}}\] BUSI 469, “Student Venture Fund: Evaluating the Startup Venture,“ BUSI 465, or Social Entrepreneurship, BUSI 464. Throughout the four-year course of study, students will

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\[\text{\textsuperscript{2}}\] “New Enterprises” will be renamed “New Enterprise Discovery” upon approval of the minor.

\[\text{\textsuperscript{3}}\] “Lilie New Venture Challenge” will be renamed “New Enterprise Launch Lab” upon approval of the minor.
additionally select from an array of electives within the Schools of Business and Engineering. All of the courses included in this proposal are already on offer (currently designated ENGI or BUSI) with the exception of a 1.0 credit Communication for Entrepreneurs lab course which has been designed and will be launched with the approval of the minor.

**Relationship between the Entrepreneurship Minor and other degree programs**

The proposed minor is a program of study that draws on the intellectual resources of several academic departments. It represents a comprehensive and substantial course of study based in peer-reviewed research on the entrepreneurial process and mindset. The minor is designed to foster new ideas and creativity in the curriculum and to provide additional value to students over and above current departmental and program offerings. Specifically, a strength of the proposed minor is that students will work together with students from across the disciplines. Notably, there is limited overlap of any sort between the courses in the proposed minor and existing minors. Rather, this minor is substantially distinct from other existing minors, including the undergraduate business minor.

In particular, we note that the courses in the proposed minor have no overlap whatsoever with the courses offered in the undergraduate business minor. This is because the frameworks and tools used in entrepreneurial settings differ substantially from those used in established businesses, which are the focus of the undergraduate business minor; the proposed entrepreneurship minor is different from the undergraduate business minor in that the courses are organized around the entrepreneurial process for starting and scaling a venture versus around the conduct of specific business functions within well-established steady-state businesses. For example, the organizations that students evaluate in BUSI 465 are all in the very early startup stage, often without commercialized product, employees or revenues. Another way to think about this distinction is through a specific comparison of the content of courses. In a course of study in the Business minor, students would be taught to forecast company financials by looking at historical financials for the company, calculating existing growth trajectories and ratios of key inputs, and forecasting steady state growth off these historical numbers—a “top-down” approach that does not rely the minute underlying individual inputs leading to the top line financial statements (and typically does not need to). In the Entrepreneurship minor courses, students are learning how to build a financial model in an environment where there are no historical financials or ratios to predict off, in new markets where they may not even be historical industry averages to employ in forecasting. Instead, students are taught how to translate the assumptions of their business models (down to the time it takes to hire and train a salesperson to get to full capacity, the cost of their travel and computers, etc.) into a “bottoms-up” cash flow model that is then used to track and test assumptions and iterate as the business enters the market. The business minor helps students build the skills required to operate within a proven business model and existing industries, in specific business functions, while the entrepreneurship minor equips students with the mindset and tools required to identify a scalable business model in conditions of ambiguity and uncertainty, and work across multiple functional areas in concert. While the entrepreneurship courses build from research that spans traditional business disciplines classes (e.g. finance, strategy), the process proposed here is distinct, both in the organization of skills and competencies and in their applications.
Student Learning Outcomes for the Entrepreneurship Minor

The learning outcomes as associated with the minor are broad and expand beyond the subject matter that departments currently offer. They are as follows:

1. Students master the core body of knowledge on **understanding the theories and frameworks appropriate to various steps of the entrepreneurial process** and how they are applied in real world settings: customer and needs identification, value proposition development and testing, developing a minimum viable product, developing a go-to-market strategy, business model design, market traction assessments, financial model construction and assessment, and team dynamics, which are not currently offered through any existing degree program at Rice University.

2. Students master the core body of knowledge on **understanding of the entrepreneurial mindset** such as identifying an unmet need, prototyping hypothesis-driven solutions, acquiring customer and user feedback on the proposed solutions, testing hypotheses and conducting evidence-based iterations, and communicating novel and transformative ideas to diverse stakeholders.

3. Students **effectively communicate concepts related to entrepreneurial ventures**, problem space and solution concepts using written, oral, and visual communication to a variety of stakeholder audiences including but not limited to experienced entrepreneurs, successful entrepreneurial alumni, and investors.

An Integrated Course of Study

The curriculum is designed based on best practices at peer institutions and academic theory developed by tenure track research academics at institutions such as MIT, Stanford University, Northwestern University and University of Toronto. We describe the content and origin of the course material for each course in Appendix A. We describe any anticipated changes to class numbering and codes in Appendix D.

Students will complete 18 units to successfully complete the minor. All students must take four core classes. These classes are:

- BUSI 220, “Lilie Design Thinking,” (3 credit hours)
- BUSI 221, “New Enterprises,” (3 credit hours)
- BUSI 223, “(Business and Financial) Modeling for Entrepreneurs,” (3 credit hours)
- BUSI 463, “Entrepreneurial Strategy,” (3 credit hours)

Students will then select 3.0 credits from the following list of courses:

- BUSI 461, “Financing the Startup,” (3 credit hours)
- ENGI 315, “Leading Teams and Innovation” (3 credit hours)
- RCEL 450, “Project Management & Leadership (2 credit hours) AND one of either ENGI 218 “Leadership Lab I” (1.0 credit hours) or ENGI 428 “Entrepreneurship Independent Study” (1.0 credit hours) or BUSI XXX “Communications for Entrepreneurs” (1.0 credit hours)

In the final year, students will complete one of the three final capstone courses:
• BUSI 469, “Lilie New Venture Challenge,”\(^{3}\) (3 credit hours), \textit{or}
• BUSI 465, “Student Venture Fund: Evaluating the Startup Venture” (3 credit hours – prerequisite: BUSI 461), \textit{or}
• BUSI 464, “Social Entrepreneurship” (3 credit hours)

Table 1. Sample academic plan for student completing the proposed entrepreneurship minor. The minor can be completed even without taking courses in the first academic year.

<table>
<thead>
<tr>
<th>Entrepreneurship minor</th>
<th>Required courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic year</td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td></td>
</tr>
<tr>
<td>Sophomore</td>
<td>BUSI 220 \textit{Lilie Design Thinking} and BUSI 221 \textit{New Enterprises}(^{2})</td>
</tr>
<tr>
<td>Junior</td>
<td>BUSI 223 \textit{Modeling for Entrepreneurs} and BUSI 463 \textit{Entrepreneurial Strategy}</td>
</tr>
<tr>
<td>Senior</td>
<td>An elective set and BUSI 469 \textit{Lilie New Venture Challenge}(^{3}) or BUSI 464 \textit{Social Entrepreneurship} or BUSI 465 \textit{Student Venture Fund: Evaluating the Startup Venture}</td>
</tr>
</tbody>
</table>

Descriptions for these courses are included in Appendix A.

Students will also be encouraged to consider taking one or both of the following courses from the School of Social Sciences, though it will not be required for completion of the minor:

• SOPA 200 \textit{Approaches to Social Policy} (3 credit hours)
• ECON 210 \textit{Behavioral Economics} (3 credit hours)
Table 2. Student Learning Outcomes in Core Classes

<table>
<thead>
<tr>
<th>Learning outcomes</th>
<th>Core classes</th>
<th>BUSI 220</th>
<th>BUSI 221</th>
<th>BUSI 223</th>
<th>BUSI 463</th>
<th>BUSI 469</th>
<th>BUSI 4XX</th>
<th>BUSI 464</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Students execute the steps of the entrepreneurial process.</td>
<td>BUSI 220</td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
</tr>
<tr>
<td>2. Students demonstrate knowledge of the entrepreneurial mindset.</td>
<td>BUSI 221</td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
</tr>
<tr>
<td>3. Students effectively communicate their entrepreneurial ventures.</td>
<td>BUSI 223</td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
</tr>
</tbody>
</table>

Table 3. Elective courses and learning outcomes

<table>
<thead>
<tr>
<th>Entrepreneurship minor</th>
<th>Elective courses (1 required)</th>
<th>Learning outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGI 315</td>
<td>Leading Teams and Innovation</td>
<td>1</td>
</tr>
<tr>
<td>RCEL 450</td>
<td>Project Management &amp; Leadership</td>
<td>2,3</td>
</tr>
<tr>
<td>BUSI 461</td>
<td>Financing the Startup Venture</td>
<td>1,2</td>
</tr>
<tr>
<td>BUSI 463</td>
<td>Entrepreneurial Strategy</td>
<td>1,2</td>
</tr>
<tr>
<td>BUSI XXX</td>
<td>Communication for Entrepreneurs</td>
<td>3</td>
</tr>
</tbody>
</table>

Assessment Plan

In coordination with the Office of Institutional Effectiveness, we have developed a plan for assessing learning outcomes for the minor. Our assessment work will take place in the three capstone courses which encompass all three of the proposed learning outcomes. Table 4 includes an overview of the proposed assessment plan for each of the three learning outcomes.
### Table 4. Detailed assessment plan for each of the three learning outcomes

<table>
<thead>
<tr>
<th>Learning outcome</th>
<th>Embedded location</th>
<th>Materials</th>
<th>Measure</th>
<th>Standard</th>
<th>Responsible</th>
<th>Timeline</th>
<th>Who receives this</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Students execute the steps of the entrepreneurial process.</td>
<td>BUSI 469 Lilie New Venture Challenge And BUSI 4XX Evaluating the Startup Venture And BUSI 464 Social Entrepreneurship</td>
<td>Final project or venture plan from entrepreneurship capstone course</td>
<td>Particular aspects of grading rubrics for final projects that assess quality of completion of tasks</td>
<td>≥ 70% students score 70% or higher</td>
<td>Director plus 2 members of the faculty advisory team</td>
<td>2019, every three years following</td>
<td>Entire Entrepreneurship minor faculty advisory team</td>
</tr>
<tr>
<td>2. Students demonstrate knowledge of the entrepreneurial mindset.</td>
<td>BUSI 469 Lilie New Venture Challenge And BUSI 4XX Evaluating the Startup Venture And BUSI 464 Social Entrepreneurship</td>
<td>Final project or venture plan from entrepreneurship capstone course</td>
<td>Particular aspects of grading rubrics for final projects that assess quality of completion of tasks</td>
<td>≥ 70% students score 70% or higher</td>
<td>Director plus 2 members of the faculty advisory team</td>
<td>2019, every three years following</td>
<td>Entire Entrepreneurship minor faculty advisory team</td>
</tr>
<tr>
<td>3. Students effectively communicate the value of an entrepreneurial venture.</td>
<td>BUSI 469 Lilie New Venture Challenge And BUSI 4XX Evaluating the Startup Venture And BUSI 464 Social Entrepreneurship</td>
<td>Final presentation or venture pitch from entrepreneurship capstone course</td>
<td>Particular aspects of grading rubrics for final projects that assess quality of completion of tasks</td>
<td>≥ 70% students score 70% or higher</td>
<td>Director plus 2 members of the faculty advisory team</td>
<td>Annually during degree audit-reviewed for all students completing the minor</td>
<td>Entire Entrepreneurship minor faculty advisory team</td>
</tr>
</tbody>
</table>
Capstone Assessment

We detail the nature of assessments in these courses below. All have approved syllabi that went through the curriculum committee.

BUSI 469 “Lilie New Venture Challenge”
Lilie New Venture Challenge is designed to support student teams that intend to bring a new venture to market. In this course, teams will apply principles taught in the other entrepreneurship and innovation framework courses to their venture. Much of the work for this class will happen outside of the classroom. During class time, the course will operate much like a lab, and student teams are expected to share learning experiences and help other student teams. Course work will be supplemented by guest speakers, alumni, and mentors who will assist in the development of student ventures.

Students learn how to:

- Draft an initial venture plan that includes assumptions about their customer, value proposition, go-to-market, business model, and unit economics,
- Begin validating the customer, value proposition, and go-to-market,
- Articulate and test a prototype to demonstrate customer engagement,
- Develop a set of next steps for the venture

At the end of the semester, each team develops and delivers a 5 minute pitch of their venture as well as writes a paper on “Next Steps” or “No-Go.” Throughout New Venture Challenge, some teams identify obstacles that will prevent them from launching their venture, while others want to move forward after the semester. At the conclusion of the semester, a final team paper is due. The “Next Steps” paper outlines the how the teams plan to move forward with their venture. For teams that do not intend to move forward, they complete a paper that describes the process they went during the semester to reach the no-go decision.

BUSI 464 “Social Entrepreneurship”
This course introduces students to contemporary concepts, debates, and contexts necessary for analyzing and engaging in the sphere of social entrepreneurship. The course has five distinct themes: (1) Social Context; (2) Organizational Forms & Collaborations; (3) Private Sector Roles; (4) Measurement and Impacts; and (5) Research Methodologies. Within these themes, students will be exposed to various topics within social entrepreneurship, such as base of the pyramid, private-NGO and private-public partnerships, voluntary social codes, benefit corporations, corporate social responsibility, stakeholder management, and ethical consumerism.

Using this foundation, students will evaluate a social entrepreneurship project about a contemporary social problem in Houston: the urban food desert (https://apps.ams.usda.gov/fooddeserts/fooddeserts.aspx). Students will learn about the social problem from a series of speakers, readings, field trips, and learn several methodologies to study the problem. With this background, students will work with an organization in the food desert space to analyze, critique, and offer improvements to particular interventions.

The major assignment for the course is an evaluation of a social entrepreneurship model in the Houston urban food desert space. The assignment will culminate with an in-class presentation and white paper towards the end of the semester.
BUSI 465 “Student Venture Fund: Evaluating the Startup Venture”

Students will identify, screen, and evaluate startups for investment by the Rice Venture Capital Fund and select startups to pitch at the Veterans Business Battle (the “VBB”). Through this highly experiential course, students will learn how to rigorously evaluate startup ventures for investment, utilize tools venture capitalists use in evaluating startup companies (including Pitchbook and Crunchbase), value and structure early stage companies, and make presentations before an investment committee of a venture capital fund.

The course combines interactive lectures by two full time professional venture capitalists and presentations by entrepreneurs raising capital. Students will apply the tools learned in the class to analyze and evaluate startups (both from the VBB and also from other venture capital funds and angel groups), will draft powerpoints and/or investment memoranda supporting their investment thesis, and present their conclusions to the class and, if selected to do so, to the Rice Venture Capital Fund investment committee. The Rice Venture Capital Fund will make investments of $25,000-$75,000 in those startups that it finds the most compelling.

Minor Management and Administration

The minor program will be guided by an advisory team which will convene annually to assess the minor. The advisory team will provide feedback to curricular decisions and help to assess the strengths of the program, based on ongoing evaluation of student learning outcomes. They will also review students enrolled, course listings, and affiliated faculty. The program will be directed by Professor Yael Hochberg, in her capacity as head of the Entrepreneurship Initiative and the Liu Idea Lab for Innovation and Entrepreneurship (Lilie). The minor will be administered on a daily basis by Lilie staffing. The director will update the advisory team of programmatic and curricular developments on a quarterly basis.

The proposed entrepreneurship minor advisory team is:

- Yael Hochberg (Chair), Ralph S. O’Connor Professor in Entrepreneurship, Professor of Finance and Head of Entrepreneurship Initiative
- Hesam Panahi, Executive Director and Lecturer, Lilie
- Moshe Vardi, Professor, Professor, Computational Engineering and Director, Ken Kennedy Institute for Information Technology

As noted above, Lilie will coordinate the administration of the minor. Lilie administrative personnel related to the minor currently consists as a 50% FTE administrative coordinator dedicated to the minor. This position may need to expand to full time and Lilie will fund the increase in this case.

Other Required Elements

The courses in the minor, course descriptions, as well as the names and rank of the faculty that are expected to teach the course courses and electives are included in Appendix A. Letters of support from Dean Peter Rodriguez (Business) and Dean Reginald DeRosches (Engineering) are attached as Appendix B. The proposed language for the General Announcements is included in Appendix C. The language meets the
applicable rules specified for inclusion of minors. We describe any anticipated changes to class titles, numbering, and codes in Appendix D.

Answers to Anticipated Questions

How is the entrepreneurship minor distinct from the business minor? Why do we need a separate minor?

The business minor teaches skills and toolsets appropriate for operating and managing existing large organizations at steady state with an established and proven business model, whereas the entrepreneurship minor trains students with the tools and mindset for developing new solutions in complex and ambiguous environments. Precisely because of this clear difference, there is no overlap whatsoever in the course list for the two minors. The faculty associated with the business minor at the business school see the entrepreneurship classes as being distinctive from and complementary to the undergraduate business minor. The proposed minor has the full support of the Business School leadership, under whose purview the Liu Idea Lab falls.

Who is likely to take this minor?

We believe the primary audience for the minor will be students whose work engages them in experiential and project-based learning. This may notably include engineering and social science majors, as well as students in the humanities and physical sciences. We do not expect the entrepreneurship minor to be as large as the business minor.

Based on the last two years of Lilie course registrations, we have found that students from a wide variety of schools and majors partake in our course offerings, with the majority of the students associated with either the School of Engineering or the School of Social Sciences. The wide scope of backgrounds is intentional - there are no course prerequisites required outside of our current offering set, meaning our current students are not required or expected to have any specific knowledge prior to starting the minor course sequence.
Are there too many non-tenure track faculty involved in this minor?

The director of the program is a tenured faculty member and nationally recognized for leading research in entrepreneurship education, and was recently the recipient of the 2016 Kauffman Medal for Distinguished Research in Entrepreneurship awarded to the top academic researcher under 40 years of age in entrepreneurship globally. A second tenured faculty member (University Professor Moshe Vardi) is part of the faculty advisory team. Classes are taught by a mix of tenure-track and clinical faculty. The participating non-tenure-track faculty are recognized nationally for their work in entrepreneurship education and have significant experience in the practice of entrepreneurship; they teach curriculum design by academic tenure-track faculty and rooted in academic research. This particular team of people are driven and passionate about equipping this next generation with an entrepreneurial education. Our faculty and staff are committed to continuous education, are committed to mentoring students outside of the classroom during evenings and weekends, and meet regularly with alumni to continue to foster the entrepreneurial spirit. While some of the elective and core courses are taught by non-tenure track faculty, given the time intensive nature of the experiential teaching and learning model and the deep engagement with students, these classes are well suited for faculty whose primary focus is that of teaching.

Who has the intellectual and academic management of the minor?

All new courses will be reviewed annually by the Entrepreneurship Minor Advisory Team, as well as relevant school-level committees. The chair for this minor will be Prof. Yael Hochberg of the Jones Graduate School of Business. Hochberg is the recipient of the 2016 Kauffman Medal for Distinguished Research in Entrepreneurship awarded to the top academic researcher under 40 years of age in entrepreneurship globally, is an elected member of the National Bureau of Economic Research (NBER), and serves on the steering committee for the NBER’s Research Program in Productivity, Innovation and Entrepreneurship.

How will busy Rice students have time to take this minor? Is there an audience for this minor?

Certainly, the rigor of the program as proposed will be a barrier for some students, particularly those pursuing double majors that demand considerable credit allocations. That said, imposing academic rigor on the study of entrepreneurship theory and application is precisely the goal of the minor structure. Keeping all this in mind, we still believe that there will be a population of students (we estimate 20 or so per year) who will be able to and will be happy to commit to the full course of study. This is in line with many undergraduate minors approved in recent years.

Note that we already have a group of committed students annually enrolling in these classes, even without the inducement of a minor, with many others expressly requesting such a minor be proposed. The proposed minor simply organizes existing course streams into an official minor, providing “official” recognition for the time current students dedicate to these courses already. As a result, we believe we will have sufficient demand to support the minor, as is.

While enrollments in individual courses do not necessarily indicate a willingness to take a full suite of courses for a minor, after extensive discussion with diverse focus groups of students from across the Rice schools, we have learned that students do in fact desire an Entrepreneurship Minor, and will commit to
taking the full suite of courses if the minor is offered. While the entrepreneurship course offerings do have good course participation, students are often frustrated that the courses do not count towards anything; they do not count towards distribution requirements and most are not cross-listed for credit in a major (with the exception of BUSI/ENGI 221). Moreover, the courses each touch on only one element of the entrepreneurial process or mindset; taking multiple courses is necessary to get the full benefit and the full picture and set of theory, tools and frameworks. Students in the course have repeatedly lamented that while they wish to take the full suite of courses, they feel hampered by the lack of any recognition at the end (in the form of an official minor). Consistent with this, Dean Reggie DesRoches of Engineering has repeatedly informed us that the engineering students have voiced an interest in this topic and would likely enroll in large numbers in a minor if offered, which indicates the students have capacity and feel there would be a benefit.

To further test future demand, this summer Lilie launched the Lilie Change Maker Summit, a 4-day collaborative and immersive experience for pre-matriculation freshmen, which introduced them to the entrepreneurial mindset and the toolkit that we cover in our courses. Despite being a last minute new offering, we had fantastic uptake and were only five seats short of total capacity. The attendees were all incoming freshmen interested in the concept of developing an entrepreneurial mindset. We believe this interest will carry over into future course and minor enrollment.

**Do students need to have an idea for an entrepreneurial project to take the courses in the minor?**

Of the courses that we offer, only one--BUSI 469--requires students to enter the course with their own idea, or to attach to a group of students who have an idea. The other two capstones do not require the students to have an entrepreneurial idea. All other courses are focused on teaching entrepreneurial theory and mindset, with the theoretical framework suggesting appropriate tools for application, which are then demonstrated using cases studies and provided problem spaces to help students understand and develop the entrepreneurial mindset. We wish to emphasize: the courses at the core of the minor focus on teaching frameworks for thinking about entrepreneurship, which are derived primarily from theoretical and empirical research developed in the academic social sciences and management literatures.

The Entrepreneurship Minor appeals to a diverse group of students because students from all disciplines recognize the inherent value in being able to think entrepreneurially, which is relevant in any field of study. By applying entrepreneurial theory, process, and mindset, these students will be equipped to identify new problem spaces, test potential solutions, and communicate transformative ideas to diverse stakeholders.

**Is the curriculum appropriate as a Minor or better framed as a Certificate?**

The criteria for minor and certificates are as follows:

*A Minor is an undergraduate academic credential that ..... provides a coherent course of study in which students both master a core body of knowledge and obtain an overview of a subject different from their Major focus of study. Certificates are intended to allow academic units to offer an academic credential that is focused on experiential learning and the acquisition of a narrow set of specific skills.*
Based on these criteria, we do not believe a certificate is appropriate here. The proposed curriculum is not a narrow set of specific skills, but rather a broad collection of varying disciplinary elements tied together with an experiential capstone. The proposed course structure and content does not fit the definition set out for a certificate. The course of study proposed in this minor bears little resemblance to the type of content emphasized in a leadership curriculum. Here, students do precisely what the minor criteria language would suggest: master a core body of knowledge and obtain an overview of a subject that is different than their major course of study.

The structure of the minor is based on a breadth of different disciplinary components and theory/frameworks taught at different levels, which the capstones aim to tie together. The body of the major (i) includes breadth; (ii) addresses knowledge gaps; (iii) adds experiential components at different levels; and (iv) ties all elements together through the capstone. Students taking one or two courses do not see the overall picture and are missing critical knowledge: they are hampered in their ability to fully take advantage of the learning opportunities in the capstones and are ill-equipped to engage in actual entrepreneurship practice.

The content of the proposed minor program focuses on theory as well as practice, and is built on the back of extensive research in the area of entrepreneurship over the last two decades. In fact, given the criteria set out by the faculty senate, we strongly believe a certificate program would send precisely the wrong message about the nature of we are trying to teach in this minor. This is subject matter that deserves and calls for a proper minor program. Top schools across the country agree and are offering it as such.

While a certificate program focuses on accrediting a narrow specific skillset, this minor equips students with a theoretical lens to assist in problem solving that spans departments and fields. Our approach in the courses is to teach frameworks and mindsets that derive from research in the social sciences and management as applied to entrepreneurial settings characterized by high uncertainty. While we place emphasis on the methods for application of entrepreneurial theory and process through experiential and applied learning opportunities, this is no different from any other applied degree program (e.g. engineering senior design capstone). Just as the business minor teaches skills and toolsets appropriate for operating and managing existing large organizations at steady state with an established and proven business model, the entrepreneurship minor trains students with the tools and mindset for developing new solutions in complex and ambiguous environments.

**Will engineering and natural science students who take the major have time to take a second capstone?**

Certainly, the rigor of the program as proposed will be a barrier for some students, particularly those pursuing double majors that demand considerable credit allocations. That said, imposing academic rigor on the study of entrepreneurship theory and application is precisely the goal of the minor structure. Keeping all this in mind, we still believe that there will be a population of students (we estimate 20 or so per year) who will be able to and will be happy to commit to the full course of study. This is in line with many undergraduate minors approved in recent years.

The Lilie faculty do appreciate this concern and agree that it is important to consider. Senior engineering students have already chosen to participate in our capstone course while taking another capstone concurrently. For example, as noted on page 2 of the proposal, we had a student team building their senior
design project (Cherrypick) in their engineering capstone while simultaneously developing their business model for their technology in BUSI 469 Lilie New Venture Challenge. We have had a significant amount of interest through our courses and business plan competitions from senior design teams wanting to understand how to commercialize the technologies they are developing in the labs. There is an opportunity to collaborate with any students in Engineering and Natural Sciences to link their major capstone project to their Lilie capstone project, e.g. a student who is working on a wearable epi-pen in their senior engineering capstone would work on business model design and developing for that same project in their entrepreneurship minor capstone. Furthermore, we note that engineering students currently make up less than 40% of our enrolled students in courses.

Will there be continued funding and support for Lilie and the minor?

We appreciate the concern about longevity, which is critical for any degree program at a university of Rice’s stature and commitment. Lilie’s gift provides funding for twenty years, with 17 years remaining on the original gift commitment. Furthermore, the gift agreement provides not only for current use funds for twenty years, but additional funds contributed annually that are building up an endowment to support the program after the end of the twenty year gift period. Thus, we do not anticipate any funding shortfalls in the next two decades or beyond. As to faculty, Rice Business has committed to hiring 2-3 additional tenure-track faculty members in entrepreneurship over the next few years who will be involved and teach in the minor. We note that most of the courses in the minor are taught by full time faculty, either tenure track or clinical. The minor courses are not reliant on any single faculty member.

The Lilie Leadership and the Business School leadership is committed to ensuring the positions are filled by qualified hires. As noted above, the Business School has committed to hiring additional tenure track faculty in this area irrespective of additional philanthropy. We further note that to date we have not found it difficult to get qualified adjunct faculty to teach. Where necessary, we simply fly them out from other cities with large entrepreneurial clusters (For example, we have an instructor co-teaching BUSI 463 in this manner this semester, flying in from San Francisco; other past instructors have driven or flown in from Austin). Rice’s reputation in entrepreneurship and our extensive network of entrepreneurial alumni allow us access to fantastic instructors from all over the U.S., so long as we are willing to commit to covering travel costs, which are able to do due to the generosity of the Lilie gift. We do not view this as particularly risky based on experiences to date. As the entrepreneurial community in Houston and Austin continues to grow, this will be even less of a risk. Importantly, we emphasize that we have not had any trouble getting those qualified individuals in the Houston and Austin ecosystems to teach for absolutely no compensation at all, or for very limited and low compensation. People in the entrepreneurial community, particularly in the Houston area, consider it a privilege to teach at Rice and to be part of the #1 ranked graduate entrepreneurship program in the nation.

Is there sufficient breath of electives in the proposed minor?

Certainly, our proposed minor has more flexibility than some minors, which are entirely lockstep (such as the Business minor, which has no choices and a fixed set of 6 courses), and less than others. Given that there is established precedent of other minors already approved at Rice that are completely lockstep (such as the Business minor), so we do not see the limited choice as being a material defect or concern.
Will there be sufficient space in the capstone courses to accommodate all students interested in the minor?

To date, we have not yet had more applicants than we have seats for our capstone courses, which have considerable capacity to absorb more students. For BUSI 469, most students apply as a team on a concept on which they have already been working, which means every student is working on their own concept/project. We have room to accommodate as many as 25 ventures for this course, and can simply add an additional section if needed. For BUSI 465, the Student Venture Fund, where students work on teams to evaluate live entrepreneurial deals and make investments in them, we have the ability to accept between 35 and 40 students annually, allowing us to meet demand well into the future. For BUSI 464, student work on project teams to tackle a live project in Houston. While this course currently sees heavy demand, we are confident that excess demand from Entrepreneurship minor students will not outpace supply for years to come, as there is considerable room for course expansion. As enrollments and demand grows, Lilie is prepared to add additional sections of the capstone courses, if and when necessary. The new tenure track faculty additions will further add extra capacity to all our courses, should it be needed. We note that in order to exceed current capacity, the entrepreneurship minor would need to grow nearly as large as the business minor or computer science major, which we do not anticipate will be the case.

*****

Appendix A: Course Descriptions and Faculty
Appendix B: Letters of Support
Appendix C: Proposed Language for General Announcements
Appendix D: Anticipated Changes to Class Titles, Numbering, and Codes
Appendix E: Minors at Other Institutions

*****

Appendix A: Course Descriptions and Faculty

<table>
<thead>
<tr>
<th>Table A1. Minor in Entrepreneurship – Core Courses, 4 required</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BUSI 220 Lilie Design Thinking</strong></td>
</tr>
<tr>
<td>Course instructor and title: Dr. Hesam Panahi, Lecturer, Lilie</td>
</tr>
<tr>
<td><strong>Course</strong></td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td><strong>BUSI 221/ENGI 221 New Enterprises</strong>&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>BUSI 463 Entrepreneurial Strategy and Founder Dilemmas</strong></td>
</tr>
</tbody>
</table>

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<sup>2</sup> Prerequisites: BUSI 220
Credit Hours: 3
Enrollment Cap: 36
Frequency: S
developed primarily by Prof. Noam Wasserman (formerly of Harvard, now Dean of the Sy Sims School of Business), a tenure-track faculty member and researcher who has produced numerous academic publications and books based on his research, which underlies the methods taught in the course.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Prerequisites</th>
<th>Credit Hours</th>
<th>Cap</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSI 223</td>
<td>Modeling for Entrepreneurs</td>
<td>Danielle Supkis-Cheek</td>
<td>BUSI 220, BUSI 221</td>
<td>3</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>BUSI 469</td>
<td>Lilie New Venture Challenge*</td>
<td>Dr. Hesam Panahi</td>
<td>BUSI 220, BUSI 221, and BUSI 463 or BUSI 461</td>
<td>3</td>
<td>10</td>
<td>S</td>
</tr>
</tbody>
</table>

Course Description:

This course teaches students to build a detailed bottoms-up quantitative model of their business, that can be used to test assumptions, track progress and deviations, and project cash flows, funding, and hiring needs. Through this course, learn how to translate a startup business idea into a bottom-up quantitative model of the business. We track progress, identify errors in underlying assumptions, and adjust.

This is an applied course drawing from accounting, finance, and other disciplines to help students understand how to create a quantitative model of their projects.

In New Venture Challenge, student venture teams participate in a capstone course experience that allows them to work on their venture with mentorship from experienced entrepreneurs, investors, and startup advisors. Enrollment is by application, with the intention of supporting student venture teams that have validated product-market fit, are working on a minimum viable product, and are considering launch and (if necessary) funding in the near future.

This course parallels similar venture development courses at peer institutions including Stanford, University of Chicago, University of Pennsylvania, and Northwestern University.
### BUSI 465 Student Venture Fund: Evaluating the Startup Venture

**Course instructor and title:** Mark Poag, Lecturer, Lilie and Jim Cohen, Lecturer, Lilie

**CAPSTONE**

Students will identify, screen, and evaluate start-ups for investment by the Rice student venture capital fund, seeded by alumnus Glenn Youngkin and various members of the Board of Trustees. Through this highly experiential course, students will learn how to rigorously evaluate startup ventures for investment, utilize tools venture capitalists use in evaluating startup companies including Pitchbook and Crunchbase, value early stage companies, and structure investments. Students will present their investment recommendations in class and ultimately to an investment committee.

The content of this course is built off of empirical and theoretical research published in dozens of peer-reviewed articles in top finance and economics journals, by renowned academic scholars as Josh Lerner (Harvard), Paul Gompers (Harvard), Steve Kaplan (University of Chicago), Antoinette Schoar (MIT), Yael Hochberg (Rice), Jay Ritter (University of Florida), David Robinson (Duke) and many others. Similar capstone courses are offered at peer institutions such as Princeton University, University of Michigan, and Dartmouth.

**Prerequisites:** BUSI 461  
**Credit Hours:** 3  
**Enrollment Cap:**  
**Frequency:** S

### BUSI 464 / SOSC 464 / GLHT 464 Social Entrepreneurship

**Course instructor and title:** Doug Schuler, Associate Professor, Rice Business  

**CAPSTONE**

**Course Description:**

This course introduces students to contemporary concepts, debates, and contexts necessary for analyzing and engaging in social entrepreneurship. The course has four distinct themes: (1) Social Context; (2) Organizational Forms & Collaborations; (3) Private Sector Roles; (4) Measurement and Impacts. The course covers certain Research Methodologies useful for studying social entrepreneurship problems in the field. Within the four themes, the course introduces various topics such as environment-organization fit, base of the pyramid, private-NGO and private-public partnerships, voluntary social codes, corporate social responsibility, stakeholders, and ethical consumerism.

Using these foundational themes, students will conduct a social entrepreneurship field project about a contemporary social problem in Houston: food insecurity and the urban food desert (https://apps.ams.usda.gov/fooddeserts/fooddeserts.aspx). Students will learn about food insecurity from a series of speakers, readings, and a field project experience. The field project focuses upon an existing intervention and organization in the food insecurity or food desert space. Working with that organization, students will study, analyze, critique, and offer improvements to that particular intervention. Many education and pedagogy scholars, examples cited below, endorse this project-based learning approach, sometimes called the constructivist framework, which has been associated with positive learning outcomes in a number of settings, including business education. Rice University
also recognized this pedagogy awarding the course with its 2018 Award for Inquiry-Based Teaching.

| Prerequisites: BUSI 220, BUSI 221, and BUSI 463 or BUSI 461  
| Credit Hours: 3  
| Enrollment Cap:  
| Frequency: S |

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**Table A2. Elective Courses – 3.0 Credits Required**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCEL 450: Engineering Project Management and Leadership Action</td>
<td>RCEL 450 provides instruction on the tools, techniques, and leadership characteristics required to successfully execute a project. The course will address the phases of project execution—initiating, planning, executing, monitoring and controlling, and closing as part of the project and the course also offers a practicum experience that allows students to practice leadership skills in an applied context. During the semester, each student will serve in a primary leadership capacity on a team, project, or other qualifying leadership exercise. In addition to facilitating the technical, management, and/or logistical requirements of the assigned leadership role, each student will participate in an individualized action learning based model of leadership development, through which he or she must implement a strategic development plan that focuses on one or more designated areas of potential growth.</td>
</tr>
</tbody>
</table>
| Prerequisites: none  
| Credit Hours: 2  
| Enrollment Cap: 15  
| Frequency: F/S |
| ENGI 315: Leading Teams and Innovation | Students learn the principles of engineering leadership, strategies for launching and leading engineering teams, and methods for utilizing creativity and innovation in engineering environments. Learning methods include case studies, simulations, group projects, and interactions with industry professionals. |
| Prerequisites: none  
| Credit Hours: 3  
| Enrollment Cap: 40  
| Frequency: F/S |
| BUSI 461 Financing the Startup Venture | This course will familiarize students with the financial and organizational challenges typical of startups seeking to raise capital to fund their ventures. The course covers knowledge gleaned from empirical academic research in venture capital and entrepreneurial finance. Topics include anticipating challenges that may arise from multi-staged financing and assessing the potential and value of early stage ventures. |
| Prerequisites: none  
| Credit Hours: 3  
| Enrollment Cap:  
| Frequency: F/S |
The content of this course is built off of empirical and theoretical research published in dozens of peer-reviewed articles in top finance and economics journals, by renowned academic scholars as Josh Lerner (Harvard), Paul Gompers (Harvard), Steve Kaplan (University of Chicago), Antoinette Schoar (MIT), Yael Hochberg (Rice), Jay Ritter (University of Florida), David Robinson (Duke) and many others. This curriculum is the standard for entrepreneurial finance courses at peer institutions across the globe.

<table>
<thead>
<tr>
<th>Course</th>
<th>Instructor and Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSI XXX Communication for Entrepreneurs</td>
<td>Janet Moore, Lecturer, JGSB</td>
<td>In this course students will apply theory and research in business communications to entrepreneurship practice. Individual sessions focus on inter-personal communications in startup settings; internal and external corporate communications; crisis communications; cross-cultural Communications; Students will be expected to conduct research, analyze case studies, and present their findings. The course strives to teach knowledge and skills immediately applicable to solving communication problems in the entrepreneurial setting.</td>
</tr>
</tbody>
</table>

Prerequisites: none  
Credit Hours: 1  
Enrollment Cap: none  
Frequency: TBD

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Appendix B: Draft Letters of Support

See following page inserts.
Date: April 2, 2020

To: Yael Hochberg  
From: Reginald DesRoches, Dean of Engineering  
Re: Entrepreneurship Minor

It is my pleasure to endorse the proposal for a minor in entrepreneurship for students at Rice. This proposal has the strong support of Engineering at Rice. The minor will provide engineering students with training in areas such as design thinking, business development, and entrepreneurship strategies. While the proposal presents a challenging academic curriculum, it also allows for engineering students to concurrently complete their engineering capstone course while developing a business model for their technology as part of the capstone course required for the minor. We believe there will be student demand for such a minor. The interdisciplinary nature of the minor will further enrich student learning.

Sincerely,

Reginald DesRoches, Ph.D., F. ASCE, F. SEI  
Dean of Engineering
April 2, 2020

Chris Johns-Krull
Professor of Physics and Astronomy
Speaker
Faculty Senate
Rice University

Dear Professor Johns-Krull,

I write to share my enthusiasm and unqualified support for the approval and establishment of an undergraduate minor in entrepreneurship for Rice University. Entrepreneurship is among our strongest business-associated disciplines and fields of research at Rice and is our most highly regarded course of study amongst peer business schools. At the graduate level, our entrepreneurship programs regularly rank among the top ten nationally across all major rankings, and was this year ranked first nationally by Princeton Review. Many, if not all of the same resources that produce such strong results for our graduate students would, and should, produce similar value for our undergraduate students.

Entrepreneurship is, by nature, a multidisciplinary field, drawing heavily form research in economics, psychology, organizational behavior and in core business disciplines, such as finance. Academic study and training in entrepreneurship are highly complementary to the development of innovative outgrowths from research in engineering and natural sciences. The development of entrepreneurial skills is essential to the development, implementation and commercialization of new medical devices, new treatment for diseases, new software-as-a-service companies, etc. For many of our students, a minor in entrepreneurship would offer both a valuable education in the economic and personal challenges of launching a new venture and would provide a path for them to elicit further value for their own scientific discoveries and techniques and those of their peers and associates.

A minor in entrepreneurship would enable Rice undergraduates to earn valuable credits towards the completion of their undergraduate degree and would be academically challenging and enriching. Moreover, I am confident that the undergraduate minor in entrepreneurship would be highly attractive to many of our undergraduates and would offer an intellectual focus and application of skills that is distinct from the undergraduate minor in business. The former focuses on the unique problems of new venture creation and development, and is especially relevant to science- and technology-related ventures. The latter centers on the development of foundational knowledge of the nature and management of firms in competitive markets.

Thank you for your consideration of this welcome new proposal for an undergraduate minor in entrepreneurship. I wholeheartedly recommend its approval.

Sincerely,

Peter Rodriguez

Rice University
P.O. Box 2932
Houston, Texas 77252

Janice and Robert McNair Hall
Room 210E – MS 531
6100 Main Street
Houston, Texas 77005

business.rice.edu
T 713 348-5928
F 713 348-5110
E peterrodriguez@rice.edu
Appendix C: Proposed Language for General Announcements

Entrepreneurship

Overview | Undergraduate | Graduate | Faculty | Courses | Codes

the Entrepreneurship Minor provide Rice students with a pathway to pursue rigorous and interdisciplinary study in the field of innovation and entrepreneurship, enabling students to understand the theory and frameworks behind different disciplinary aspects of entrepreneurship and how to apply these theories to develop and scale innovative solutions to societal problems. At the heart of the entrepreneurship minor is the entrepreneurial process and mindset. This structured process has its origins in decades of research exploring the process for commercialization of new technologies and the launching of new ventures. The process includes identifying an unmet user and customer need, articulating a value proposition, developing a strategy to bring new concepts to market, designing a sustainable business model, assessing market traction, communicating a vision to key stakeholders, and building and managing appropriate teams. The process involves the mastery of theory-driven frameworks, tools and competencies, and, as in engineering and the sciences, the practical application of these theories. The campus-wide, multi-disciplinary Liu Idea Lab for Innovation and Entrepreneurship (Lilie), serves as a home for the minor. Working out of Lilie, students will demonstrate their mastery in a final capstone project to be completed in the final year of study.

Contact Information

Yael Hochberg
Program Director
hochberg@rice.edu

Entrepreneurship

Overview | Undergraduate | Graduate | Faculty | Courses | Codes

Minor

• Minor in Entrepreneurship

Entrepreneurship

Overview | Undergraduate | Graduate | Faculty | Courses | Codes

Entrepreneurship does not currently offer an academic program at the graduate level.
Entrepreneurship

Overview | Undergraduate | Graduate | Faculty | Courses | Codes

Director
Yael Hochberg, Entrepreneurship

Advisory Committee
Yael Hochberg
Hesam Panahi
Moshe Vardi

For Rice University degree-granting programs:
To view the list of official course offerings, please see Rice's Course Catalog
To view the most recent semester's course schedule, please see Rice's Course Schedule

Description and Code Legend

Note: Internally, the university uses the following descriptions, codes, and abbreviations for this academic program. The following is a quick reference:

Course Catalog/Schedule
• Course offerings/subject codes: Courses from various subjects may apply towards this program.

Program Description and Code
• Entrepreneurship: ENTR

Undergraduate Minor Description and Code
• Minor in Entrepreneurship: ENTR

CIP Code and Description¹
• ENTR Minor: CIP Code/Title: [TBD]
Entrepreneurship

Program Learning Outcomes for the Minor in Entrepreneurship

Upon completing the minor in Entrepreneurship, students will be able to:

1. Execute the steps of the entrepreneurial process.
2. Demonstrate knowledge of the entrepreneurial mindset.
3. Communicate effectively the value of an entrepreneurial venture.

Requirements for the Minor in Entrepreneurship

Students pursuing the minor in Entrepreneurship must complete:

- A minimum of 6 courses (18 credit hours) to satisfy minor requirements.
- A minimum of 3 courses (9 credit hours) at the 300-level or above.
- 4 courses (12 credit hours) to satisfy Core Requirements.
- 1 or 2 courses (3 credit hours) to satisfy Elective Requirements.
- 1 course (3 credit hours) to satisfy the Capstone Requirement.

The courses listed below satisfy the requirements for this minor. In certain instances, courses not on this official list may be substituted upon approval of the minor’s academic advisor, or where applicable, the Program Director. (Course substitutions must be formally applied and entered into Degree Works by the minor’s Official Certifier). Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

| Total Credit Hours Required for the Minor in Entrepreneurship | 18 |

Minor Requirements (18 Credits)

Required Core Courses (12 Credits)

| BUSI 220 | LILIE DESIGN THINKING | 3 |
BUSI 221 / ENGI 221  NEW ENTERPRISES  3
BUSI 223  (BUSINES AND FINANCIAL) MODELING FOR ENTREPRENEURS  3
BUSI 463  ENTREPRENEURIAL STRATEGY  3

Elective Requirements (3 Credits)

BUSI 461  FINANCING THE STARTUP VENTURE  3
ENGI 315  LEADING TEAMS AND INNOVATION  3
PROJECT MANAGEMENT AND LEADERS (2)

+ ONE OF THE FOLLOWING:

RCEL 450 AND ONE OF:
ENGI 218 or ENGI 428 or BUSI XXX  LEADERSHIP LAB (1)
COMMUNICATIONS FOR ENTREPRENEURS (1)
COMMUNICATIONS FOR ENTREPRNEURS (1)

Capstone Requirement (3 Credits)

Select 1 from the following:

BUSI 464 / GLHT 464 / SOSC 464  SOCIAL ENTREPRENEURSHIP  3
BUSI 469  LILIE NEW VENTURE CHALLENGE  3
BUSI 465  STUDENT VENTURE FUND: EVALUATING THE STARTUP VENTURE)  3

Total Credit Hours  18

Entrepreneurship

Outcomes | Requirements | Policies | Opportunities

For additional information, please see the Entrepreneurship website: https://entrepreneurship.rice.edu

Entrepreneurship
| Outcomes | Requirements | Policies | **Opportunities** |

For additional information, please see the Entrepreneurship website: https://entrepreneurship.rice.edu
Appendix D: Course Name Changes

Anticipated changes to class names and numbering

We anticipate changes to select existing class names and numbers, and the addition of a new number to one class. These changes are described below.

Renaming of existing classes

(1) BUSI 221/ENGI 221, “New Enterprises” to be renamed “New Enterprise Discovery”

(2) BUSI 469, “New Venture Challenge” to be renamed “New Enterprise Launch Lab”

Renumbering of existing classes

(1) BUSI 463, “Entrepreneurship Strategy” to be changed to 300 level

(2) BUSI 461, “Financing the Startup Venture” to be changed to 300 level

New classes to be assigned a number

(1) BUSI 3##, “Communication for Entrepreneurship”
## Appendix E: Minors at Other Institutions

<table>
<thead>
<tr>
<th>Northwestern University</th>
<th>Core Courses (15 Credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farley Center for Entrepreneurship &amp; Innovation, McCormick School of Engineering</td>
<td>- Principles of Entrepreneurship (ENTREP 225) OR Engineering Entrepreneurship (ENTREP/IEMS 325)</td>
</tr>
<tr>
<td>Farley Center for Entrepreneurship and Innovation’s Undergraduate Minor in Entrepreneurship (24 Credits)</td>
<td>- Leadership, Ethics &amp; You (ENTREP 360) OR Entrepreneurship Demystified (ENTREP 361)</td>
</tr>
<tr>
<td></td>
<td>- Startup Accounting &amp; Finance (ENTREP 330)</td>
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<tr>
<td></td>
<td>- Entrepreneurial Sales &amp; Marketing (ENTREP 331) OR Storytelling for Business (ENTREP 311)</td>
</tr>
<tr>
<td></td>
<td>- Any Farley Center experiential course - includes NUvention courses, Radical Entrepreneurship (ENTREP 350), and Innovate for Impact (ENTREP 340)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specialize (9 Credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electives can be any combination of the following options:</td>
</tr>
<tr>
<td>- Any Farley Center course: <a href="https://www.farley.northwestern.edu/we-teach/index.html">https://www.farley.northwestern.edu/we-teach/index.html</a></td>
</tr>
<tr>
<td>- Independent Study (ENTREP 399/499 with Farley Center faculty member - Max. one unit)</td>
</tr>
<tr>
<td>- Other coursework related to entrepreneurship from other programs, including BIP, Segal, Medill/IMC (must be a 300-level course and students must get prior approval from the Farley Center)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cornell University</th>
<th>Core Course (3 Credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC Johnson School of Business</td>
<td>- AEM 2220 Foundational Perspectives and Contemporary Issues in Entrepreneurship</td>
</tr>
</tbody>
</table>

| University-Wide Minor in Entrepreneurship and Innovation (MEI) (17 Credits) |
|-------------------------|---------------------------|

<table>
<thead>
<tr>
<th>Teams and People (2 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- HADM 4835 Leading and Managing Teams</td>
</tr>
<tr>
<td>- HADM 4115 Managing Professional Relationships</td>
</tr>
<tr>
<td>- HADM 4170 Hospitality Leadership</td>
</tr>
<tr>
<td>- ILRHR 4603 Work Groups and Teams</td>
</tr>
<tr>
<td>- ILROB 4230 Leadership in Organizations</td>
</tr>
<tr>
<td>- NBA 5150 Leadership Theory and Practice</td>
</tr>
<tr>
<td>- NCC 5540 Managing and Leading in Organizations</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Entrepreneurship in Practice (3 Credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- AEM 3249 Entrepreneurial Marketing and Strategy</td>
</tr>
<tr>
<td>- AEM 3250 Business Plan Process for New Ventures</td>
</tr>
<tr>
<td>- HADM 4145 Developing a Hospitality Business Plan</td>
</tr>
<tr>
<td>- ENGRG 4610 Entrepreneurship for Engineers</td>
</tr>
<tr>
<td>- NBA 3000 Entrepreneurship and Private Equity</td>
</tr>
</tbody>
</table>

| Experiential Application and Guided Exploration (9 Credits) |
Take 9 credits in one of the following 9 categories:
- Technology & New Ventures
- Technology & Small Business and Private Enterprise
- Technology + Corporate Entrepreneurship
- Social + New Venture
- Social + Small Business and Private Enterprise
- Social + Corporate Entrepreneurship
- Food and Beverage + New Venture
- Food and Beverage + Small Business and Private Enterprise
- Food and Beverage + Corporate Entrepreneurship

<table>
<thead>
<tr>
<th>MIT</th>
<th>Core Courses (6 Credits)</th>
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<tbody>
<tr>
<td></td>
<td>15.359J/6.901J Engineering Innovation: Moving Ideas to Impact</td>
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<tr>
<td></td>
<td>15.373J/2.912J/3.085J Venture Engineering</td>
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</tbody>
</table>

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<thead>
<tr>
<th>MIT Innovation Initiative</th>
<th>Context (3 Credits)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>3.086 Innovation and Commercialization of Materials Technology</td>
</tr>
<tr>
<td>Entrepreneurship &amp; Innovation Minor (15 Credits)</td>
<td>6.805[J] Foundations of Information Policy</td>
</tr>
<tr>
<td></td>
<td>11.005 Introduction to International Development</td>
</tr>
<tr>
<td></td>
<td>11.123 Big Plans and Mega-Urban Landscapes</td>
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<tr>
<td></td>
<td>11.142 Geography of the Global Economy</td>
</tr>
<tr>
<td></td>
<td>11.165 Energy and Infrastructure Technologies</td>
</tr>
<tr>
<td></td>
<td>14.46 Innovation Policy and the Economy</td>
</tr>
<tr>
<td></td>
<td>15.031[J] Energy Decisions, Markets, and Policies*</td>
</tr>
<tr>
<td></td>
<td>15.3641 Regional Entrepreneurship Acceleration Lab (REAL)</td>
</tr>
<tr>
<td></td>
<td>17.307 American Public Policy for Washington Interns</td>
</tr>
<tr>
<td></td>
<td>17.309[J] Science, Technology, and Public Policy</td>
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<tr>
<td></td>
<td>17.315 Health Policy</td>
</tr>
<tr>
<td></td>
<td>17.33 Building a Better World</td>
</tr>
<tr>
<td></td>
<td>STS.002 Finance and Society</td>
</tr>
<tr>
<td></td>
<td>STS.004 Intersections: Science, Technology, and the World</td>
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<tr>
<td></td>
<td>STS.011 Engineering Life: Biotechnology and Society</td>
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<tr>
<td></td>
<td>STS.032 Energy, Environment, and Society</td>
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<tr>
<td></td>
<td>STS.081[J] Innovation Systems for Science, Technology, Energy, Manufacturing, and Health</td>
</tr>
<tr>
<td></td>
<td>STS.088 Africa for Engineers</td>
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<tr>
<td></td>
<td>EC.701[J] D-Lab: Development</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Leadership of Teams and Organizations (3 Credits)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2.96 Management in Engineering</td>
<td></td>
</tr>
<tr>
<td>6.915 Leading Creative and Innovative Teams</td>
<td></td>
</tr>
<tr>
<td>10.02 Foundations of Entrepreneurship for Engineers</td>
<td></td>
</tr>
<tr>
<td>15.3941 Dilemmas in Founding New Ventures</td>
<td></td>
</tr>
<tr>
<td>15.668 People and Organizations</td>
<td></td>
</tr>
</tbody>
</table>
- GEL 1 12 units completed as part of the GEL 1 Certificate (6.902, 6.911, 6.912) may be counted towards this requirement

**Experiential (3 Credits)**
- 2.009 The Product Engineering Process
- 2.750[J] Medical Device Design
- 2.752 Development of Mechanical Products
- 2.760 Global Engineering
- 3.042 Materials Project Laboratory
- 4.031 Design Studio: Objects and Interaction
- 6.170 Software Studio
- 6.811[J] Principles and Practice of Assistive Technology
- 6.813 User Interface Design and Implementation
- 15.3781 Building an Entrepreneurial Venture: Advanced Tools and Techniques
- 15.3901 New Enterprises
- 15.3991 Entrepreneurship Lab
- 21W.789 Communicating with Mobile Technology
- CMS.339 Virtual Reality and Immersive Media Production
- CMS.610 Media Industries and Systems: The Art, Science and Business of Games
- CMS.611[J] Creating Video Games
- EC.720[J] D-Lab: Design
- EC.7## One 9- or 12-unit D-Lab subject meeting the criteria for this category may be counted towards the E&I Experiential requirement (selection must be approved by Minor Advisor).