

**ENGINEERING BUSINESS MINOR AND**  
**COMPARISON TO GENERAL BUSINESS**  
**AND ENTREPRENEURSHIP MINORS**

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**ENTREPRENEURSHIP, INNOVATION, AND BUSINESS**

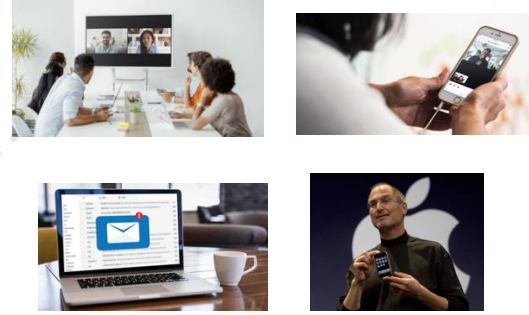
**9 SEPTEMBER 2024**



# There are so many ways new ventures leveraged technological innovations to improve our world and create value.



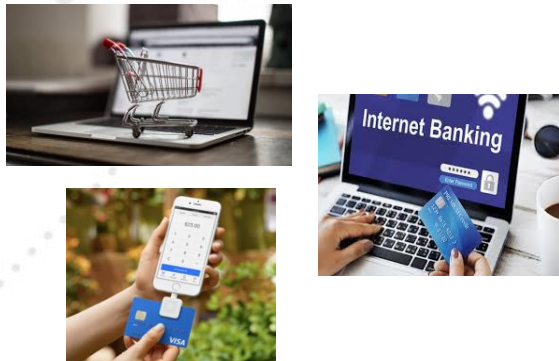
Improving our health and quality of life



Keeping us in touch



Getting us to where we need to go



Increasing ways to conduct commerce



Improving the supply and diversity of food



Making our homes more livable and energy efficient

*...and many more*

## McKinsey & Company on Technology

**“Technology continues to be a primary catalyst for change in the world.”**





































**“We expect changes will accelerate and intensify in the years to come”**

**“What impresses us more than anything else is the massive effect that technology will have on every sector.”**

2023 Survey of leading CEOs – Trends Have the biggest impact on their companies:

**#1 Rise of disruptive digital technologies**

# Largest Companies by Market Capitalization – Tech Dominates

Rank	Name	Market Cap	Price	Today	Price (30 days)	Country
☆	1  <b>Apple</b> AAPL	\$3.340 T	\$219.74	▼ 0.49%		 USA
☆	2  <b>Microsoft</b> MSFT	\$3.004 T	\$404.22	▲ 0.63%		 USA
☆	3  <b>NVIDIA</b> NVDA	\$2.575 T	\$104.98	▲ 2.09%		 USA
☆	4  <b>Alphabet (Google)</b> GOOG	\$1.835 T	\$149.79	▼ 1.41%		 USA
☆	5  <b>Amazon</b> AMZN	\$1.833 T	\$174.66	▲ 1.91%		 USA
☆	6  <b>Meta Platforms (Facebook)</b> META	\$1.275 T	\$504.31	▲ 0.81%		 USA
☆	7  <b>Berkshire Hathaway</b> BRK-B	\$1.002 T	\$465.04	▲ 1.22%		 USA
☆	8  <b>Eli Lilly</b> LLY	\$810.83 B	\$900.50	▼ 0.24%		 USA
☆	9  <b>Tesla</b> TSLA	\$688.04 B	\$215.38	▲ 2.20%		 USA
☆	10  <b>Broadcom</b> AVGO	\$636.62 B	\$136.76	▼ 0.17%		 USA
☆	▲1 11  <b>Walmart</b> WMT	\$621.15 B	\$77.28	▲ 0.83%		 USA
☆	▼1 12  <b>JPMorgan Chase</b> JPM	\$615.35 B	\$216.28	▲ 1.80%		 USA

Market cap on Sep 9 2024



**Engineering and Technology**

*Plus*

**Business and Innovation**

*Equals*

**Impact**

## Minor

### Engineering Business

### General Business (conferred by McIntire)

### Entrepreneurship (McIntire plus E-School for Tech Concentration)

## AY 2023-24

- Previous EBM closed to new applicants
- New EBM is approved and opened to applicants

- 15 credits
- Pilot year
- Declare when eligible  
(COMM 1800 plus 2 core)

- 15 credits
- 3 Concentrations
- Apply in Feb (need ENTP 1010)

## AY 2024-25

- New EBM: 15 credits
- Product & innovation
- Apply in Oct '24 or Feb '25

- Ramp up
- Declare when eligible

- Continues
- Apply in Feb

- Please consult school websites for the latest information -

**The new Engineering Business Minor curriculum focuses on business fundamentals, innovation, product development, markets, and professional skills.**

- ✓ Updated requirements to reflect the importance innovation and product development play in technology-centric businesses.
- ✓ Incorporate input from accomplished alumni, recent graduates, and faculty.
- ✓ Differentiate the Engineering Business Minor from the McIntire General Business Minor.
- ✓ Construct a minor that allows for incorporation of discipline-specific electives focused on the application of engineering skills and knowledge.

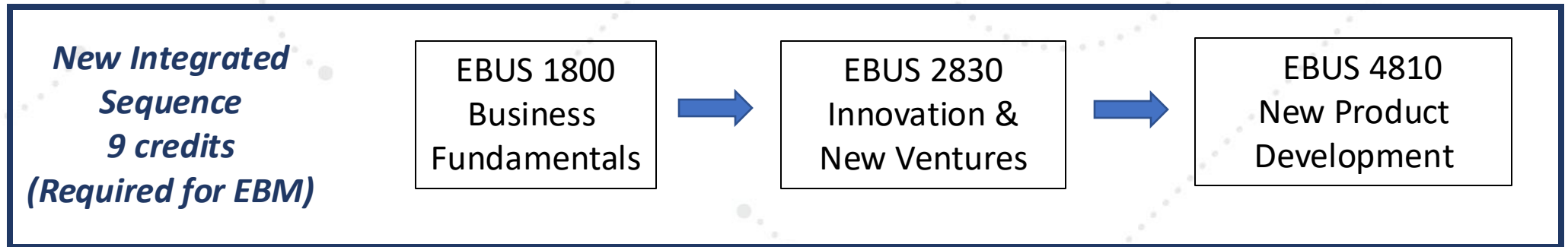
**Students completing the new UVA Engineering Business Minor will focus on specific key learning objectives.**

### **Engineering Business Minor Key Learning Objectives**

- ✓ Develop an understanding of company structures, how functions work together to serve customers, and differences between early-stage ventures and established large companies.
- ✓ Be able to comprehend and create financial statements and evaluate businesses via basic financial analyses.
- ✓ Learn how to apply techniques to identify unmet customer needs, evaluate market opportunities, and define compelling value propositions.
- ✓ Acquire an understanding of product development and business building frameworks and learn how to apply them to achieve product-market fit.
- ✓ Appreciate the role innovation plays in business and learn how to look for and develop opportunities to leverage technology to create value.
- ✓ Build professional soft skills in communications, self awareness, teamwork, and continuous learning.



# The revised Engineering Business Minor anchors on a 3-course “Integrated Sequence” and combine business fundamentals and innovation concepts.



**Add 6 credits from list of approved electives**



Key criteria for approved electives:

- ✓ Consistent with EBM learning objectives
- ✓ Directly relevant to working in technology and engineering industries
- ✓ Complementary to required courses

More info here: <https://engineering.virginia.edu/undergraduate-study/future-undergrads/special-academic-programs/business-and-entrepreneurship-programs>

## STS => EBUS Mnemonic

- Starting in Summer '24, all Engineering Business and Tech Entrepreneurship classes will be identified with the EBUS code.
- Existing course numbers will remain the same, e.g., STS 1800 Business Fundamentals becomes EBUS 1800 Business Fundamentals.
- The same course previously taken under the STS code can be used to fulfill the new EBM requirement under the EBUS code (and vice versa for students pursuing the old EBM, though EBUS courses cannot be used to fulfill the STS 2/3XXX elective requirement).
- As with COMM classes, EBUS courses qualify only as Unrestricted Electives.

The revised set of requirements will leverage three existing courses that have been updated and improved over previous years.

<b>EBUS 1800 Business Fundamentals</b>	<b>EBUS 2830 Innovation &amp; New Ventures</b>	<b>EBUS 4810 New Product Development</b>
<p>This course introduces students to key business topics relevant to high technology companies. Students will learn how to understand and interpret financial statements and frame financial decisions, including building a business case. The course will explore typical organizational structures and the roles of business functions. Students will be introduced to business models and other concepts in marketing and business strategy.</p>	<p>An introduction to concepts innovators use to solve problems and create value by addressing unmet needs. Learn how to identify and evaluate opportunities and use proven entrepreneurial frameworks to create new products and businesses for companies of all sizes. Through class activities, projects, and presentations you will learn how storytelling, teamwork, and leadership skills are essential for starting, funding, and building your business.</p>	<p>Students will learn the fundamentals of product management. Topics include identifying unmet needs, understanding markets, implementing product development frameworks and processes, building businesses, and working with multi-functional teams. The application of these concepts to different phases of the product lifecycle will be explored. Students will build technical, professional, and soft skills necessary for success in product management.</p>

## Students will be able to choose from the following approved electives:

### **EBUS Electives** (formerly STS)

EBUS 2730 Engineers & the Art of the Deal  
EBUS 2840 Entrepreneurial Finance  
EBUS 2850 Government & Entrepreneurship  
EBUS 2890 Driving Business Growth Through  
Innovation: Past to Present  
EBUS 3570 Special Topics in Eng Business:  
Leadership in the Tech Sector  
EBUS 4580 Special Topics in Eng Entrprnrship:  
Innovation Garage

### **COMM Electives**

COMM 2600 Leadership Across Disciplines  
COMM 3200 Project & Product Management  
COMM 3230 Managing Innovation  
COMM 3410 Commercial Law I  
COMM 3845 Foundations in Int'l Business  
COMM 3880 Global Sustainability  
COMM 4822 Investing in Sustainable Future  
ENTP 1010 Intro to Entrepreneurship

### **SEAS Departmental Electives**

APMA 3150 From Data to Knowledge  
BME 3030 Innovation & Design in Medicine  
CE 2030 Mgt of Eng & Constr Project  
CE 3010 Project Business Planning  
CS 4260 Internet Scale Applications  
ENGR 4880 Business & Tech Leadership in Engr  
MAE 4502 The Business of Engineering  
SYS 2/3054 Systems case Studies (Int'l)  
SYS 4000 Financial Aspects of Engineering  
SYS 4044 Engr Economic Systems

### **Other Electives**

ECON 2010 Prin of Econ: Microeconomics

- Course offerings are dependent on instructor availability.
- Plan is to expand SEAS departmental electives, as available and appropriate.
- Elective list will evolve over time.

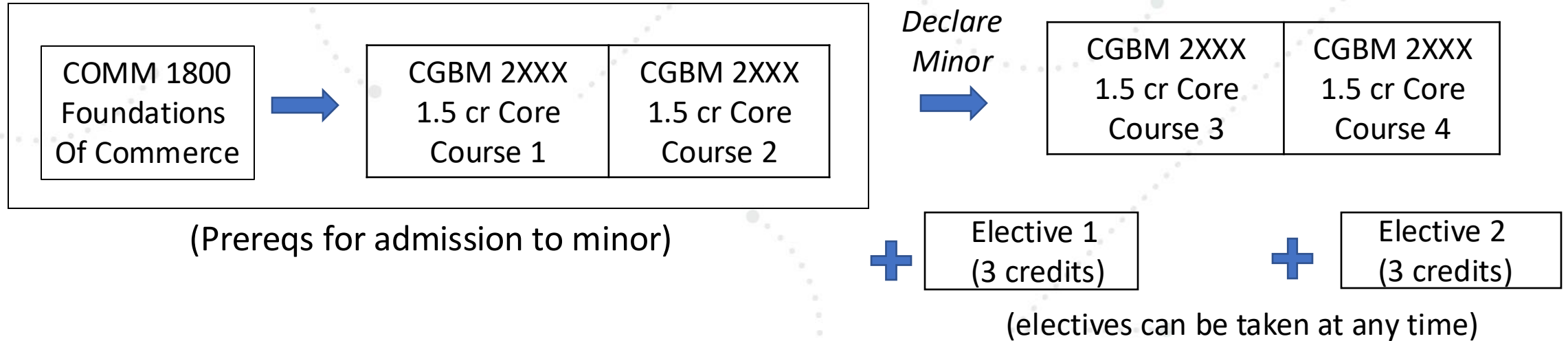
## Students will be admitted to the Engineering Business Minor (EBM) via a lightweight application process.

- The application process will be run by the EBM Program team within Systems & Information Engineering and open to all Engineering and BA Computer Science students.
- The EBM application will require:
  - Student identification information
  - Student GPA, primarily to verify good academic standing
  - A brief statement on interest in pursuing the EBM
  - An acknowledgement by the student that they are confident that they can complete the curriculum before their planned graduation date (there will be no restrictions on student year)
- Students can take relevant courses before being admitted. Those courses will count for the EBM's requirements. Admitted EBM students may receive preference to enroll in EBM-required courses.
- EBUS 1800 will likely become a pre or co-requisite for most higher level EBUS courses.

## Students can also consider the McIntire General Business Minor and Entrepreneurship Minor, the latter of which includes a tech concentration offered in partnership with the Engineering School.

- General Business Minor
  - Students must start with COMM 1800.
  - Following completion of COMM 1800 and two of the four 1.5 credit core courses, students can declare the minor (no application process).
  - The approved elective list includes four EBUS (formerly STS) courses.
  - More info can be found here: <https://www.commerce.virginia.edu/minors/general-business>
- Entrepreneurship Minor
  - Three concentration areas: 1) Innovation in Business, 2) Social Entrepreneurship, 3) Technology Entrepreneurship
  - Concentration areas are defined by taking one core course and one capstone course.
  - Students must take or be enrolled in ENTP 1010 to apply to the minor.
  - The application process is usually in February.
  - More info can be found here: <https://www.commerce.virginia.edu/minors/entrepreneurship>

# General Business Minor – 15 credits



Required Core Courses (1.5 credits each)	
CGBM 2110 Accounting for Business	CGBM 2310 Marketing Principles: Goods, Services and Brands
CGBM 2210 Digital Skills for the Workplace	CGBM 2710 Making Financial Decisions

Current info can be found here: <https://www.commerce.virginia.edu/minors/general-business>



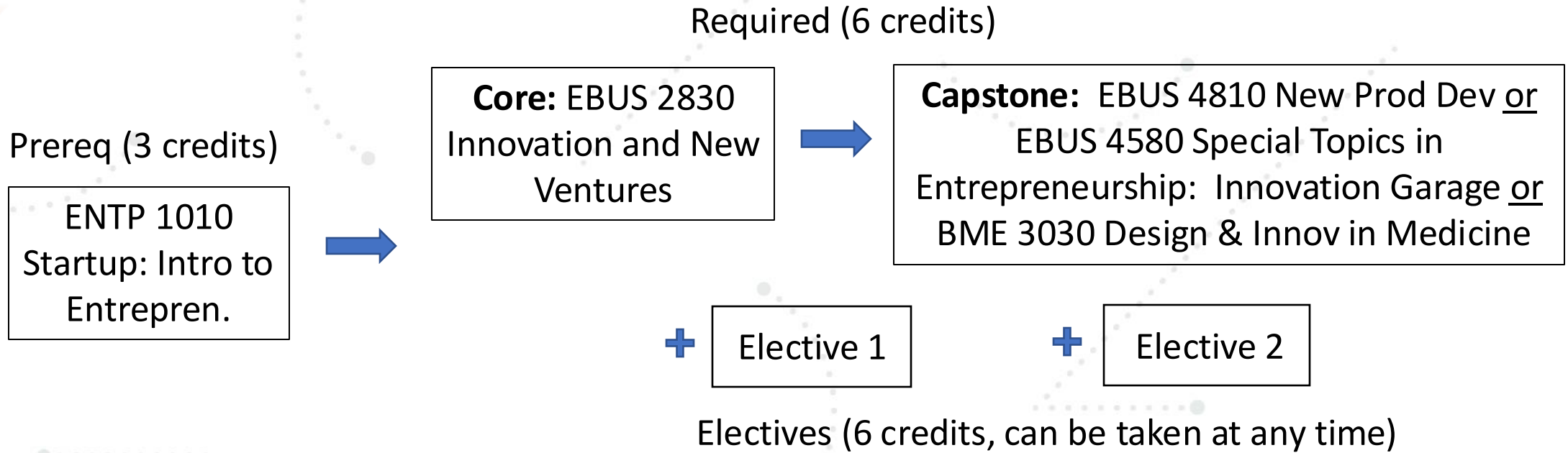
# General Business Minor Approved Electives

- COMM 2020 - Introduction to Management Accounting Credits: 3
- COMM 2730 - Personal Finance Credits: 3
- COMM 3410 - Commercial Law I Credits: 3
- COMM 3570 - Topics in Finance Credits: 3 - Foundations of Sustainable Commerce
- COMM 3700 - Markets and Investing Credits: 3 - *(Course last offered fall 2022)*
- COMM 4380 - Consumer Behavior and Marketing Strategy Credits: 3
- COMM 4520 - Topics in Information Technology Credits: 1 to 3 - Ethical Application of Artificial Intelligence (3 credits); previously offered as COMM 4559
- COMM 4560 - Topics in Management Credits: 3 - Doing Business in China
- COMM 4570 - Topics in Finance Credits: 3 - Finance and Society; previously offered as COMM 4559
- COMM 4741 - Foundations of Global Commerce Credits: 3
- ECON 2010 - Principles of Economics: Microeconomics Credits: 3 - *(Will not count as elective for Economics majors)*
- EBUS 2730 - Engineers & the Art of the Deal Credits: 3
- EBUS 2830 - Innovation and New Ventures Credits: 3 (or STS equivalent)
- EBUS 2850 - Government and Entrepreneurship Credits: 3
- EBUS 4810 - New Product Development Credits: 3
- LPPS 3440 - Intro to Mngmt Consulting & Strategic Decision Making Credits: 3
- SYS 3054 - Systems Case Studies Credits: 3

Current information here: [https://records.ureg.virginia.edu/preview\\_program.php?catoid=61&poid=8866](https://records.ureg.virginia.edu/preview_program.php?catoid=61&poid=8866)



# Entrepreneurship Minor – Technology Concentration – 15 credits



Most Popular Electives (6 credits, choose from ~40):		EBUS Electives
COMM 1800 Foundations of Commerce	PSYC 2600 Into to Social Psych	EBUS 1800 Business Fundamentals
COMM 2020 Intro to Mgt Acctg	ECON 3010 Inter Microeconomics	EBUS 2730 Engineers & the Art of the Deal
COMM 3420 Commercial Law II	EDLF 2050 Transforming Lives of Youth	EBUS 2840 Entrepreneurial Finance
		EBUS 2850 Government and Entrepreneurship
		EBUS 2890 Driving Business Growth Through Innovation

Current info can be found here: <https://www.commerce.virginia.edu/minors/entrepreneurship>

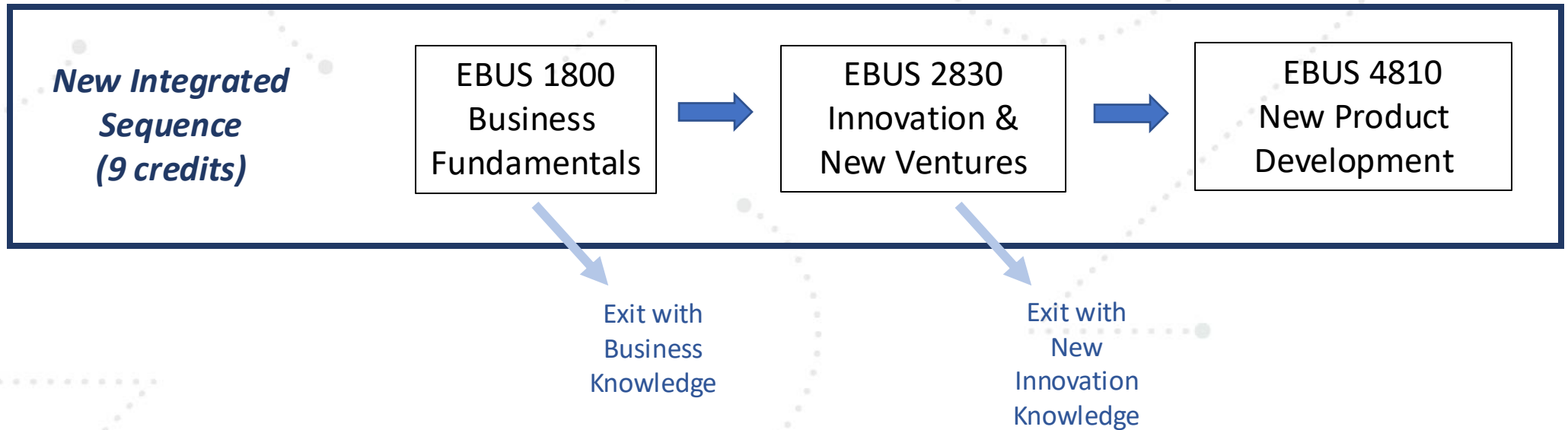
General Business Minor (15 credits)	New Engineering Business Minor (15 credits)	Entrepreneurship Minor – Tech Concentration (15 credits)
<p>3 credits</p> <p>COMM 1800 Foundations of Commerce</p>	<p>3 credits</p> <p>EBUS 1800 Business Fundamentals</p>	<p>3 credits</p> <p>ENTP 1010 Intro to Entrepreneurship</p>
<p>6 credits (4 x 1.5 credits)</p> <p>CGBM 2110 Accounting for Business CGBM 2210 Digital Skills for Workplace CGBM 2310 Marketing Principles CGBM 2710 Making Financial Decisions</p>	<p>6 credits (2 x 3 credits)</p> <p>EBUS 2830 Innovation &amp; New Ventures EBUS 4810 New Product Development</p>	<p>6 credits (2 x 3 credits)</p> <p>EBUS 2830 Innovation &amp; New Ventures EBUS 4810 New Product Development <u>or</u> EBUS 4580 Spec Topics: Innovation Garage <u>or</u> BME 3030 Design &amp; Innov in Med</p>
<p>6 credits</p> <p>Choose from list of 17 courses</p>	<p>6 credits (2 x 3 credits)</p> <p>Choose from list of 25 courses, including discipline-specific courses</p>	<p>6 credits (2 x 3 credits)</p> <p>Choose from list of ~40 courses</p>

**McIntire**

**Engineering School**

**McIntire  
+ E-School for Tech Track**

The revised EBM's integrated sequence also provides a path for multiple learning paths, depending on student interest and schedule flexibility.



The new sequence also anchors either the new EBM or current Entrepreneurship Minor:

#### **New Engineering Business Minor**

- ✓ New sequence becomes core
- ✓ Add two electives

#### **Entrepreneurship Minor – Tech Conc.**

- ✓ Add ENTP 1010 Intro to Entrepreneurship
- ✓ Add Tech Concentration capstone

# ***Making the Right Choice for You***

 **UVA McINTIRE**  
General Business Minor

 **UVA ENGINEERING**  
Engineering Business Minor

 **UVA McINTIRE**  
Entrepreneurship Minor

# Positioning of New EBM versus McIntire GBM



## Engineering Business Minor

- ✓ Focused on product development, business building, and engineering management
- ✓ Tailored to engineering student curriculum and skills (e.g., strong quantitative and technical skills)
- ✓ Allows for electives that are appropriate only for engineering students

***=> Best for students interested in engineering, product management, and working in technology-centric businesses***

***=> Can also be an option for students interested in technical consulting or advising tech businesses***



## General Business Minor

- ✓ Provides general business foundational business knowledge
- ✓ Structured to accommodate students from the full array of schools and majors
- ✓ Elective list is maintained by McIntire

***=> Best for students broadly interested in business and careers that include banking, general consulting, and non-technical industries***

***=> Can also be an option for students interested in technology-based businesses***

# Positioning of Revised EBM versus McIntire Entrepreneurship Minor



## Engineering Business Minor

- ✓ Focused on product development, business building, and engineering management
- ✓ Tailored to engineering student curriculum and skills (e.g., strong quantitative and technical skills)
- ✓ Allows for electives that are appropriate only for engineering students

***=> Best for students interested in engineering, product management, and working in technology-centric businesses***

***=> Can also be an option for students interested in intrapreneurship and startups***



## Entrepreneurship Minor

- ✓ Focused on skills required to found a company with some coverage of corporate innovation
- ✓ Requires completion of an entrepreneurship capstone course
- ✓ Elective list is maintained by McIntire

***=> Best for students who are interested in founding a startup (now or later)***

***=> Can also be an option for students interested in intrapreneurship***

# University of Virginia Entrepreneurship Ecosystem



ENGINEERING

Entrepreneurship Minor/Tech

**TECH ENTREPRENEURS IN ACTION:**

**/// DISTINGUISHED SPEAKER SERIES**

DARDEN SCHOOL  
of BUSINESS

Batten Institute

Research on entrepreneurship  
Faculty sponsorship

**i.Lab Incubator**  
catalyst.

**Entrepreneurship Cup**



FRANK BATTEN SCHOOL  
of LEADERSHIP and PUBLIC POLICY

Entrepreneurship Minor/Social



**Licensing & Ventures Group**

**UVA LVG Seed Fund**



**CORPS**  
NSF Innovation Corps



Entrepreneurship Minor

**Galant Center for  
Innovation and  
Entrepreneurship**



ECONOMIC DEVELOPMENT



**“The Foundry” UVA’s new pan-University Entrepreneurship Center**

Whatever you pursue, remember:

**“Nothing great was ever achieved  
without enthusiasm”**

- Ralph Waldo Emerson





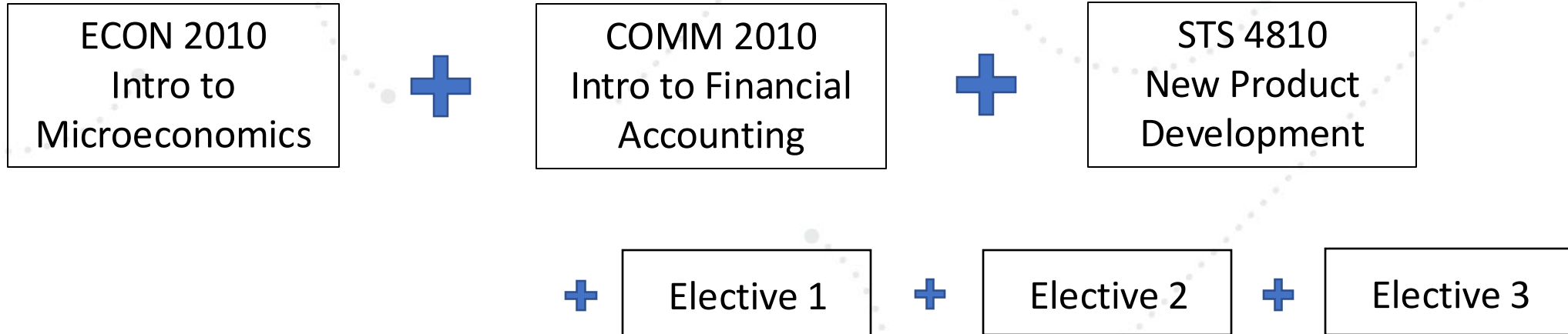
# Appendix

## The approved electives for the revised Engineering Business Minor will fall into the following categories.

Category	Comments
EBUS Courses (formerly STS)	<ul style="list-style-type: none"><li>• Engineering Business and Tech Entrepreneurship</li><li>• In addition to the three required courses, the school currently supports four to five EBUS electives per year.</li><li>• All catalog-listed EBUS course are approved electives but some may not be offered due to lack of instructor.</li><li>• 2/3/4000 level special topics classes also in catalog</li></ul>
COMM Classes	<ul style="list-style-type: none"><li>• Selected classes that meet the EBM's elective criteria</li><li>• Note that many 4000-level COMM classes that may meet the criteria are restricted to McIntire students</li></ul>
SEAS Technical Electives	<ul style="list-style-type: none"><li>• Selected departmental courses that are closely related to product development and key business capabilities (e.g., innovation, design, and commercialization).</li><li>• Courses also satisfy technical elective requirements, helping students with accessibility of the minor.</li></ul>
Other Classes	<ul style="list-style-type: none"><li>• Selected classes that meet the EBM's elective criteria</li><li>• Expect very few classes in this category</li></ul>

# Original Engineering Business Minor – 18 credits

(must already be enrolled to pursue the EBM)



## Most Popular Electives (choose from a list of dozens):

- COMM 2020 Intro to Mgt Acctg
- COMM 3410 Business Law
- ECON 2020 Macroeconomics
- ENTP 1010 StartUp: Intro to Entrp
- STS 2850 Gov't & Entrepreneurship
- STS 1800 Business Fundamentals
- STS 2840 Entrepreneurial Finance
- STS 2830 Innovation & New Ventures
- ECON 3030 Money & Banking