

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

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ENTREPRENEURSHIP, INNOVATION, AND BUSINESS

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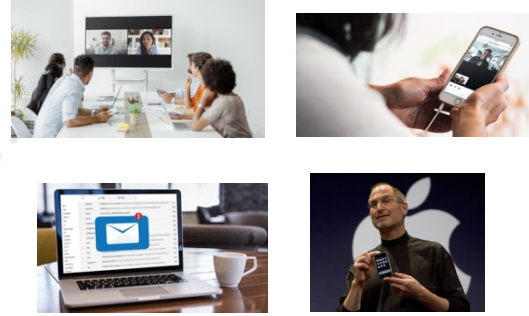


UVA ENGINEERING

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



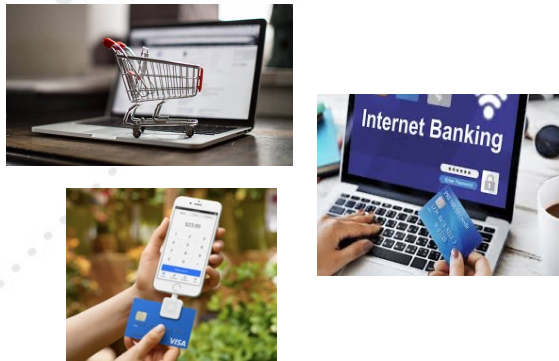
Improving our health and quality of life



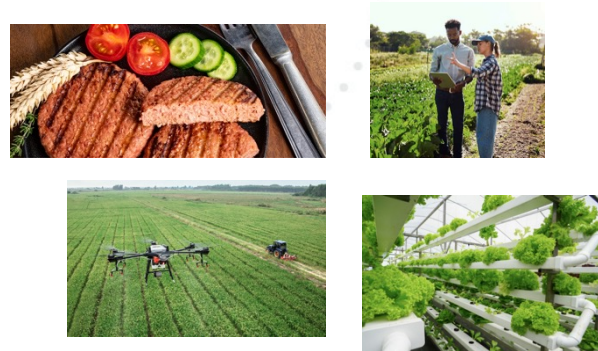
Keeping us in touch



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

Market cap on Sep 9 2024



Engineering and Technology

Plus

Business and Innovation

Equals

Impact

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

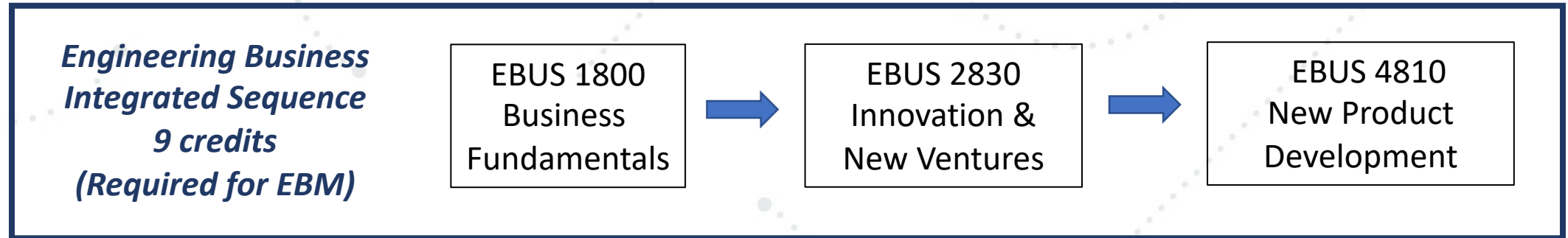
- ✓ Reflects the importance innovation and product development play in technology-centric businesses.
- ✓ Incorporates input from accomplished alumni, recent graduates, and faculty.
- ✓ Differs from the McIntire General Business Minor by focusing on product and business development.
- ✓ Allows for incorporation 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 combines 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>

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

<p align="center">EBUS 1800 Business Fundamentals</p>	<p align="center">EBUS 2830 Innovation & New Ventures</p>	<p align="center">EBUS 4810 New Product Development</p>
<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>

Note: In general, substitutions are not allowed for any one of the three EBM required core courses.

Electives for the Engineering Business Minor fall into the following categories.

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

EBM 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.

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

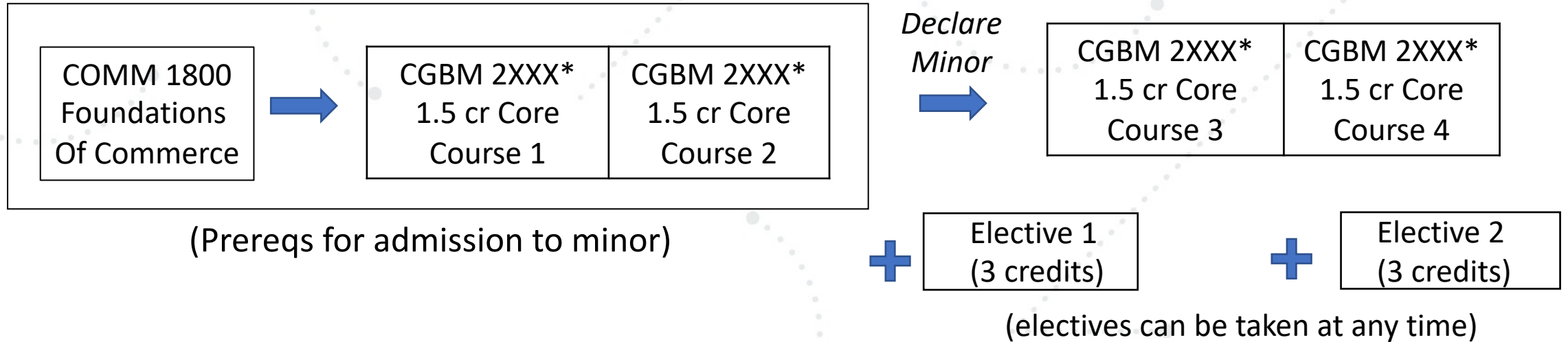
Students will be admitted to the Engineering Business Minor (EBM) via a lightweight application process.

- 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.
- Students should start the minor by taking EBUS 1800.

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 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 usually opens in November and closes 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

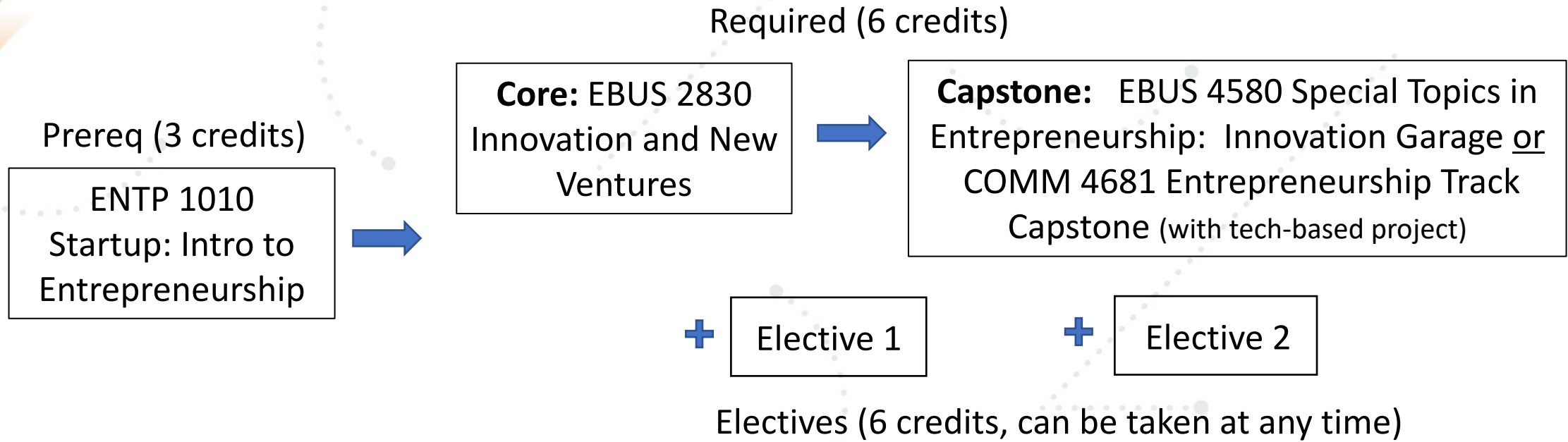
Current info can be found here: <https://www.commerce.virginia.edu/minors/general-business>

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

Entrepreneurship Minor – Technology Concentration – 15 credits



EBUS Electives	
EBUS 1800 Business Fundamentals	EBUS 2890 Driving Business Growth Through Innovation
EBUS 2730 Engineers & the Art of the Deal	EBUS 4810 New Product Development
EBUS 2840 Entrepreneurial Finance	BME 3030 Design and Innovation in Medicine
EBUS 2850 Government and Entrepreneurship	SYS 3501 Special Topics in Systems & Info Engineering

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

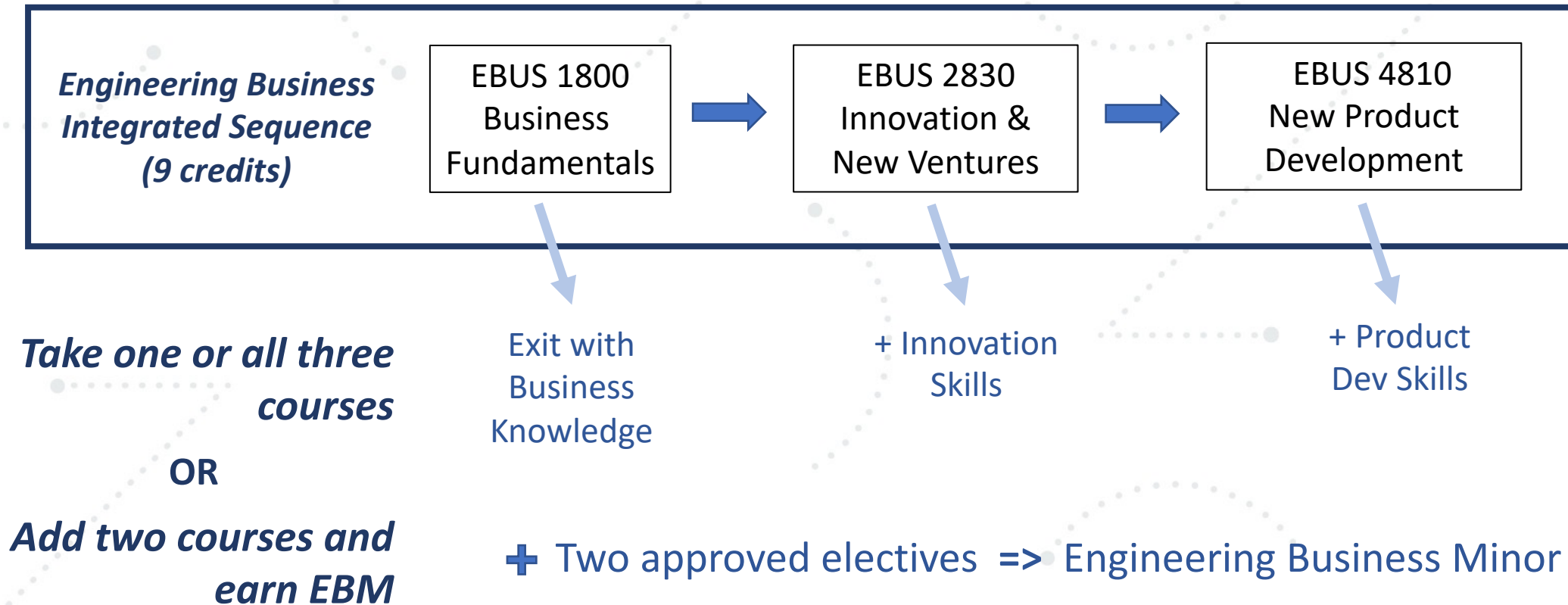
General Business Minor (15 credits)	New Engineering Business Minor (15 credits)	Entrepreneurship Minor – Tech Concentration (15 credits)
3 credits COMM 1800 Foundations of Commerce	3 credits EBUS 1800 Business Fundamentals	3 credits ENTP 1010 Intro to Entrepreneurship
6 credits (4 x 1.5 credits) CGBM 2110 Accounting for Business CGBM 2210 Digital Skills for Workplace CGBM 2310 Marketing Principles CGBM 2710 Making Financial Decisions	6 credits (2 x 3 credits) EBUS 2830 Innovation & New Ventures EBUS 4810 New Product Development	6 credits (2 x 3 credits) EBUS 2830 Innovation & New Ventures Capstone: EBUS 4580 Spec Topics: Innovation Garage <u>or</u> COMM 4681 Entrepreneurship Capstone
6 credits Choose from list of 17 courses	6 credits (2 x 3 credits) Choose from list of 25 courses, including discipline-specific courses	6 credits (2 x 3 credits) Choose from list of 37 courses

McIntire

Engineering School

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

The Engineering Business Integrated Sequence also provides a path for multiple learning paths, depending on student interest and schedule flexibility.



Note: Students who complete the Engineering Business Integrated Sequence can choose to add ENTP 1010 Intro to Entrepreneurship and a Tech Concentration capstone class to earn the Entrepreneurship Minor.

Making the Right Choice for You

 **UVA McINTIRE**
General Business Minor

 **UVA ENGINEERING**
Engineering Business Minor

 **UVA McINTIRE**
Entrepreneurship Minor

Positioning of the EBM versus the 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 the EBM versus the 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



Entrepreneurship Minor/Tech

TECH ENTREPRENEURS IN ACTION:

/// **DISTINGUISHED SPEAKER SERIES**

VentureForward
- funding, mentoring -



UVA McINTIRE
Entrepreneurship Minor

Galant Center for
Innovation and
Entrepreneurship

DARDEN SCHOOL
of BUSINESS

Batten Institute

i.Lab Incubator



Workshops, Mentoring
Community

Entrepreneurship Cup



UVA LVG Seed Fund



UVA's platform to catalyze innovation and entrepreneurship

Whatever you pursue, remember:

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

- Ralph Waldo Emerson



Appendix

Minor

Engineering Business

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

- Updated EBM: 15 credits
- Product & innovation
- Apply in Oct '24 or Feb '25
- New course code – EBUS

General Business

(conferred by McIntire)

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

- Ramp up
- Declare when eligible

Entrepreneurship (McIntire plus E-School for Tech Concentration)

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

- Continues
- New Tech Entrepreneurship capstone: Innovation Garage
- Apply in Feb

AY 2023-24

AY 2024-25

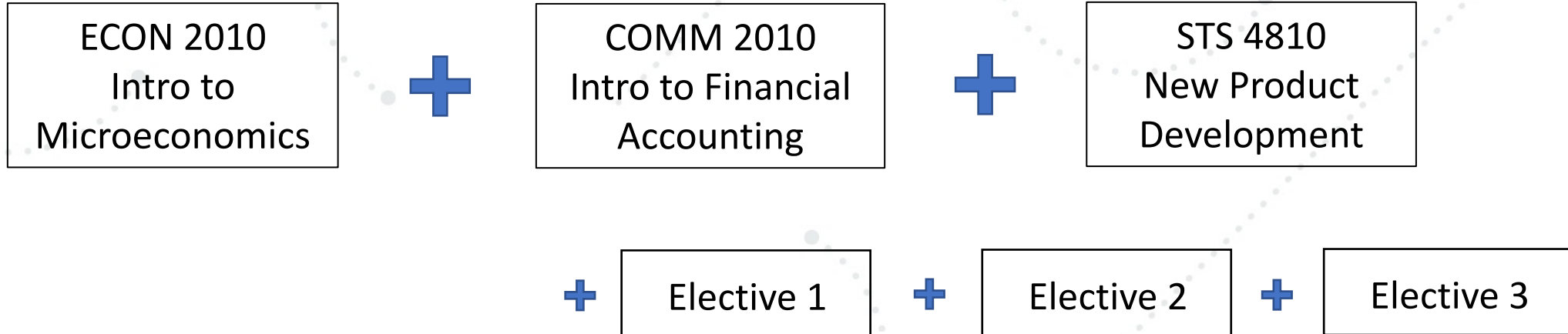
- Please consult school websites for the latest information -

STS => EBUS Mnemonic

- Starting in Summer '24, all Engineering Business and Tech Entrepreneurship classes are 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.

Previous Engineering Business Minor – 18 credits

(must already be enrolled to pursue the Previous 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

Note: The EBM was first offered in 2003. The curriculum requirements were updated in 2024, and the previous program was closed to new applicants.