Carnegie Mellon University Qatar

Minor in Tech Entrepreneurship

Minor Advisor: Dr. Nui Vatanasakdakul

The minor in Tech Entrepreneurship provides students with an in-depth, interdisciplinary, understanding in the field of entrepreneurship with a focus on the use of digital technologies. This SDM for the Qatar campus is uniquely inter-disciplinary by design and covers leadership, management and technological platform development skills. In addition, it involves core entrepreneurial skills of identifying market opportunities, assembling resources, writing business plans and pitching to investors. The coursework structure is designed to prepare students to explore career paths in startups utilizing digital technologies and platforms. It highlights the changes in entrepreneurial practice, theory and education in the digital economy, and various technologies that enhance innovation. Students will learn how to develop critical thinking on new ways of creating ventures and online businesses. This includes aspects of designing new products & services, tech communication and collaborative marketing, funding of new ventures, emerging market opportunities & risks, and analysis of competitive advantages. Students will learn the interplay between business, technology and society through the lens of entrepreneurship.

Target students

This minor targets students in all disciplines at CMU's Qatar campus (CMU-Q). It is intended to create a learning platform for students to develop an ability to integrate their background knowledge with an entrepreneurial mindset.

Key learning outcomes (LO)

A student who completes this will be able to:
Develop an entrepreneurial mindset by formulating digital startup ventures, business plans and presentations in a variety of contexts, initially in Qatar and the GCC region.
Identify market needs and risks, and propose, pitch and present viable digital solutions with real-world applications.
Apply skills from the business field (e.g. finance, marketing, operations) to identify the criteria and requirements for a successful digital business.
Apply emerging technologies to create successful digital businesses.
Understand the importance of successful management, governance and culture.

Academic requirements and Program of Study

One pre-requisite course (9 units) and six additional courses (54 units) must be completed to fulfill the Minor in Tech Entrepreneurship. In order to complete some of the courses, it may be necessary for the student to take other courses as prerequisites, however, these courses are not formally required for the minor.

- *The pre-requisite to declaring this minor successful completion of 15-110 with a B grade or higher, or successful completion of 15-112.*
- *Each student declaring the minor must take at least three (3) of the six (6) courses outside of their own major program of study.*
- *No more than two (2) courses may double count between the minor and requirements of their major or other minors.*
- *Double counting with general education courses is unlimited.*

Courses are categorized into four modules: fundamentals of entrepreneurship (9 units); digital design and technology (18 units); organizational intelligence (18 units); and a capstone/project course (9 units). The description and rational underlying each module are discussed below.

1. Fundamentals of Entrepreneurship (9 units)

   This module consists of an introductory or gateway course that provides a foundation in entrepreneurship (70-415 or 15-390). *This module must be the first course completed in the SDM*.

2. Digital Design and Technology (18 units)
   This module focuses on the courses related to technology. It aims to enable students from all backgrounds to develop some knowledge on digital technology. It provides a great range of technology-related courses including coding (programming and system development) courses and non-coding courses. For those with less coding experience, students can choose to learn about the design and adoption of technology. Thus, students from all backgrounds will have the opportunity to advance their knowledge on digital technology, based on their interests and skill levels.

3. Organizational Intelligence (18 units)
   This module provides an understanding of various aspects of business operations and management of business and technology. These courses will help students to develop their skills on how to manage digital businesses. Students can advance their knowledge on business aspects of entrepreneurship within this module. *Students must choose one (1) business course from this module.*

4. Capstone/project course (9 units)

   This course is the final course taken in the SDM. It is experiential and project-based, providing hands-on and team-based learning experiences for students. Students will work in teams to create a startup business by utilizing existing knowledge and applying the lean startup philosophy. They will also learn how to turn ideas into startup businesses and engage stakeholders in the real world. They may further engage with incubation centers and turn their projects into viable businesses.

All of the courses listed below are offered at CMU-Q. *Other courses beyond those identified may be considered and counted towards the SDM with the approval of the minor advisor*.

Modules	Learning Outcomes	Number of required courses	Courses *(Green color indicates no pre-reqs; red color indicates some pre-reqs)*
Fundamentals of Entrepreneurship	1, 5	1	• 70-415 Introduction to Entrepreneurship • 15-390 Entrepreneurship for Computer Science
Digital Design and Technology	2, 4	2	• 67-265 Design Fundamentals I: Shaping Interactions and Experiences • 67-338 Information & Grid Design • 67-315 A Web for Everyone • 67-379 Introduction to Geographical Information Systems

			• 67-354 Information Systems and Sustainability • 67-240 Mobile Web Design & Development • 67-316 Human Computer Interface Design and Testing • 67-357 Healthcare Analytics and Big Data • 67-313 Digital Risk Management, Assurance and Auditing • 67-352 E-business and Design Thinking • 67-364 Practical Data Science • 70-417 Topics in Entrepreneurship • 70-455 Modern Data Management • 10-315 Introduction to Machine Learning • 11-411 Natural Language Processing • 11-485 Introduction to Deep Learning • 15-281 AI: Representation and Problem Solving • 15-488 Machine Learning in a Nutshell • 15-330 Introduction to Computer Security • 17-313 Foundations of Software Engineering • 15-316 Software Foundations of Security and Privacy • 15-440 Distributed Systems • 15-441 Computer Networks • 15-415 Database Applications • 16-311 Introduction to Robotics • 15-348 Embedded Systems • 15-282 Artificial Intelligence for Medicine
Organizational Intelligence	2, 3, 5	2	• 70-440 Corporate Strategy • 70-122 Introduction to Accounting • 70-443 Digital Marketing and Social Media Strategy • 70-395 Funding Entrepreneurial Ventures • 67-318 Business Process Modeling and Implementation • 67-382 Digital Transformation, Strategy and Management • 70-416 New Venture Creation • 70-311 Organizational Behavior • 70-318 Managing Effective Work Teams
Capstone/Project Course	1, 2, 3, 4, 5	1	67-474 Tech Startup Launchpad *(pre-reqs waived for students who have declared this minor, are seniors, have already taken at least three (3) of the other five (5) required courses, and have planned the remaining two courses in Stellic)*

Sample course sequence within the IS student curriculum:

Fundamentals of Entrepreneurship	70-415 sophomore fall
Digital Design and Technology	67-352 junior fall, 67-338 junior spring
Organizational Intelligence	67-382 junior spring, 70-443 senior fall
Capstone	67-474 senior fall

Sample course sequence within the CS student curriculum:

Fundamentals of Entrepreneurship	15-390 sophomore fall
Digital Design and Technology	67-352 junior fall, 67-338 junior spring
Organizational Intelligence	67-382 junior spring, 70-443 senior fall
Capstone	67-474 senior fall

Sample course sequence within the BA student curriculum:

Fundamentals of Entrepreneurship	70-415 sophomore fall
Digital Design and Technology	67-352 junior fall, 67-338 junior spring
Organizational Intelligence	67-382 junior spring, 70-443 senior fall
Capstone	67-474 senior fall

Sample course sequence within the Bio student curriculum:

Fundamentals of Entrepreneurship	70-415 sophomore fall
Digital Design and Technology	67-354 junior fall, 70-417 junior spring,
Organizational Intelligence	67-382 junior spring, 70-443 senior fall
Capstone	67-474 senior fall

Carnegie Mellon University Qatar

Minor Declaration Form
Tech Entrepreneurship

Student Information

Name: _____

Last Name, First Name

Andrew ID: _____ Current Class: FR ◯ SO ◯ JR ◯ SR ◯ 5th ◯

Major: _____

Expected Graduation Semester: _____

Student Signature: _____ Date: _____

Tech Entrepreneurship Minor Audit

Fundamentals of Entrepreneurship (1 course)					
Course Name	Course Number	Section	Semester	Units	Final Grade
Digital Design and Technology (2 courses)					
Course Name	Course Number	Section	Semester	Units	Final Grade
Organizational Intelligence (2 courses)					
Course Name	Course Number	Section	Semester	Units	Final Grade
Capstone Course (1 course)					

Administrative Use Only

Approve: ◯ Deny: ◯ Rationale for Denial: _____

Dr. Nui Vatanasakdakul SDM Advisor: _____ Date: _____

Print/Signature