Technology Based Entrepreneurship



Delft Centre for Entrepreneurship

DELFT CENTRE FOR ENTREPRENEURHSHIP



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020504

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The minor Technology-Based Entrepreneurship offers a basis for students who would like to supplement their technical knowledge and skills with entrepreneurship knowledge and skills in order to create and seize new opportunities in the market. The minor is offered by the Delft Center for Entrepreneurship (DCE) and teachers from the TPM, IDE and 3ME faculties. By means of an integral case study, the knowledge and skills are applied in a project at an existing technologydriven SME.

INTRO

"This knowledge ... with your technical discipline make you an interesting candidate ... for radical innovative projects and or to start your own company."

After completing the minor you will be able to analyse markets and estimate technological developments, analyse starting organizations and indentify (technical) opportunities in the market. This knowledge, combined with knowledge from your technical discipline, make you an interesting candidate to join existing organizations, to attract radical innovation projects or to to start your own business.

Technology Based Entrepreneurship

Delft Centre for Entrepreneurship (DCE) is part of the Faculty of Technology, Policy and Management. DCE's vision is to be a leading institute in the field of entrepreneurship, innovation research and education. DCE teaches master's and bachelor's degrees and contributes to PhD supervision and other educational programs. The programs educate approximately 750 students across all faculties at TU Delft, with the goal of encouraging entrepreneurship and the creation of new technology start-ups and innovation projects at corporates.

This minor prepares you for entrepreneurship in its broadest sense. Entrepreneurship is understood as the entrepreneurial action taking and setting up of new business within existing organizations or starting your own company. The minor in Technology-Based Entrepreneurship provides a basis for students who would like to complement their technical knowledge and skills with entrepreneurial knowledge and skills in order to create and seize new opportunities in the market. The minor is offered by the Delft Centre for Entrepreneurship (DCE) and lecturers from the faculties of TBM and IO. Through an integrated case study, the knowledge and skills are applied in a project that brings together an idea, a market and a technology into a viable startup.

DCETBE

Learning objectives

At the end of the minor, the student will be able to:

- Design a business value proposition based on an unmet customer need.
- Identify relevant market segments and a beachhead market, through testing the value proposition based on primary and secondary market research.
- Design a blueprint and competitive positioning of the value proposition.
- Based on a stakeholder map, design a go-to market (and communication) strategy and cash flow statement.
- Based on the value proposition, develop and present a fully validated business model.
- Adjust this business model on the basis of interpretation of new (market) developments or (product) information.
- Reflect (in detail) on his own suitability as an entrepreneur and that of team members.
- Act as a discussion partner based on knowledge of entrepreneurial and functional areas.

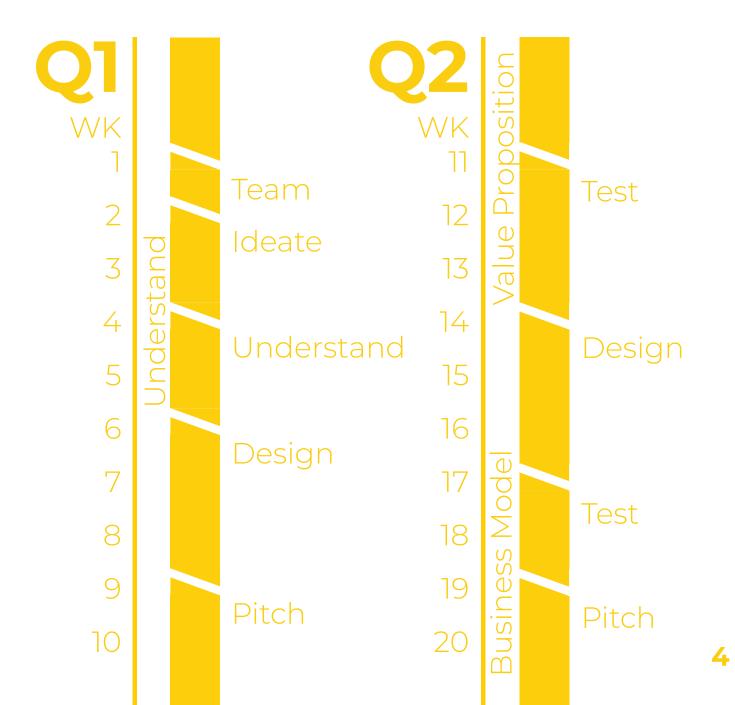
Teaching methods

The student will thus need to be able to successfully recognize the iterative process of entrepreneurship and to manage and ensure study progression through various feedback loops. Importantly, the student will not find a solution once, but will experiment, validate and evaluate and learn valuable lessons from the market, product and customers. In addition, the student will also receive feedback in Peer Reviews and have to gather feedback himself from the market, experts, teachers and fellow students. Central to this is the Case Study in which the student applies the knowledge gained, to which the other subjects flank and provide relevant knowledge for the progression of the case projects. To support the student in this, lectures and tutorials are organized, and the students must show proactivity in the free study time.



Education design

The half-year duration of the minor-with the workload of assignments and lectures-is far too short to properly and fully build a start-up. The goal is mainly to let you experience and learn, by doing. To ensure that you and your team do not get stuck in one step, the minor is divided into three different themes (preparation, value proposition & business model) that are further divided into nine phases. During these phases, you will gain knowledge in the context of that phase and you will be able to apply this to your project using course material. By presenting to fellow students at the end of each phase and providing your fellow students with feedback, we ensure that you continue to produce, validate and improve quickly. See the figure below for an overview of the themes and phases. On the next page is an explanation of each theme.



Themes

Understand

The minor will focus on a deep dive into your personal business assumptions. Before this happens, it is important for your project team to first understand what competencies you have on board, what the dynamics are and what ideas might actually be interesting. With this acquired understanding, you can assess what interesting markets are and identify initial business opportunities.

Value Proposition

In the previous block, you came up with ideas and have already done initial market research. You are probably convinced that you have value on your hands. But is this unique value? Now focus on understanding the market further. Who are you creating value for, who is paying and why should customers buy from you and not a competitor? These are questions we will focus on during these weeks.

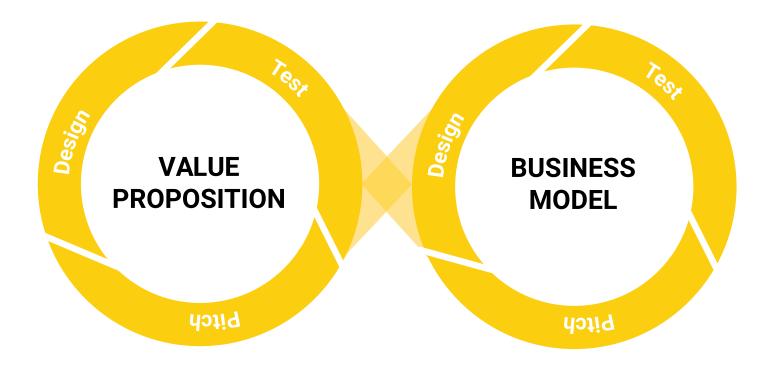
Business Model

Around this time, you will probably have been able to demonstrate that you have value in hand. You may have already found interested parties. Do you already know how much you will charge for this? And how will customers pay for your product? How do you ensure that the number of paying customers continues to grow? In these weeks, we will focus on how you ensure that your business remains financially sound and will be able to scale.

Pivoting

Most likely, the first idea your team came up with will not be the egg of Columbus. Most likely, neither will the second. Rest assured: it rarely is. Pivoting is very common in startup development. Through market research and technical research, many of your assumptions can be validated making previous ideas seem not so smart after all. However, you do have more knowledge of the market and have more insight on the existing problems in the market that you might be able to find something for.

You probably noticed that for the last two themes, there are three recurring phases (design, pitch, test; see the figure below). Anyone can put something credible on paper, but that doesn't mean it's right. Thus, the focus will be during "test" that you actually talk to customers and get feedback on your ideas. We can't tell you enough: Continuing to iterate and go through the steps again will make your startup better! Do you fall flat on your face or get your startup cut in half? Don't worry, this happens to everyone. FAIL = First Attempt In Learning.



Overview Courses

Q1 WK 1	Intro			Q	2 wk 11	study	Managing Startups	Finance	D&P
2			S		12	Case	St	ш	
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TBM017A

10 ECTS

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Literature

MANDATORY:

Bill Aulet (2013), Disciplined Entrepreneurship: 24 Steps to a Successful Startup

Case Study

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Q2

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The Case Study is the integration moment where the knowledge and skills learned from the individual modules of the minor come together. After all, nothing is more instructive than getting to work yourself to actually apply all the knowledge learned. The goal is to work out your own innovative idea and develop it into a realistic market proposition. Each team, consisting of 5 students from different fields of study, comes up with its own innovative product idea and works it out using assignments and examples. The guiding principle for this course is Bill Aulet's Disciplined Entrepreneurship method. This textbook is required and will be used from cover to cover. It is advisable to buy the hard copy of this book so that you can browse it quickly and stick Post-It's and take notes in relevant places. It is a useful purchase because you will refer to it often. In that respect, an e-book is not a good alternative.

Learning objectives

- You develop the skills to start a technology enterprise and analyze the market in which it operates;
- 2. You learn (iteratively) to become increasingly proficient in developing the relevant product-market combinations;
- 3. You learn how to implement the chosen product-market combination in the existing market and make a thorough competitive analysis;
- 4. You find the business model that best suits your innovative solution.

Education method

- Lectures twice a week
- Peer Reviews
- Student own initiative

20



Grading

Quizz Aulet 10% Midterm Pres. 25% Businessmodel Pres. 25% Final Pres. 10% Final Businessplan 20% Buddy Check 10%

Assesment & grading

Assessment of this subject is partly individual and partly by group. The assessment of this is six-tiered. It is important that the student is proactive, gives (meaningful) feedback to his fellow students on which the course relies. Furthermore, it is important that the student himself also knows how to deal with the feedback and incorporate it into his products. It is important that the products delivered are also correct and good studies are done. Together with the final presentation, these are assesments that will be judged as a group. You will have to submit these deliverables to BrightSpace before the deadline! Late is late. So grades can vary quite a bit within one group. So put your best effort and show a proactive attitude, for yourself and your team! In addition, there is also a pass/fail exam on Aulet's book. More details on this will follow later.

Structure of the Lectures

The lecture format changes each term and is divided into lectures and team sessions. You are expected to take responsibility for scheduling enough time for the course with your team.

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Case Landmark Study Document

1.	Week start date	Content Monday The numbers in parentheses are Aulet's learning units.	Upload Wednesday	Presentation Thursday	Comments
1.1	4/9	Openingsweek	4 – 8 september		Mo: Pulse hall 1 Tu: Pulse hall 2 We: Pulse hall 3 Th: Green village/Pulse hall 2 FR: Pulse hall 1
1.2	11/9	Ideation, top 8 and top 3, PMR examples (0)	13 September BS 23.00 hrs Upload Preso: startdocument	14 Sep Preso start document and teams (no grade)	Cohort A en B: Victor Scholten Cohort C & D: Tom Dolkens
1.3	18/9	TAM/SOM practicum, persona, customer job + P&G, Full case, sheets (1,2,3,4,5)			September 24 Upload Quizz Aulet Brightspac 23:00.
1.4	25/9	(6,7 en 8)	27 september BS 23.00 uur Upload Preso: Ideation		
1.5	2/10	Instructions upload Understanding the market		October 5 Preso Ideation (no grade)	Cohort A & B: Ron Cohort C & D: Tom/Johannes/I Cohort A en B: Echo Hall C Cohort C & D: Echo Hall D
1.6	9/10	Instruction upload Design Value Proposition, (10 & 11)	11 oktober BS 23.00 uur Upload Doc: Understanding the market		
1.7	16/10	Traction; Instruction midterm & dry runs - No lectures	18 October 23.00 hrs Upload Doc: Designing the Value Proposition		
1.8	23/10	-			-
	30/10 & 6/11				

1.	Week start date	Content Monday The numbers in parentheses are Aulet's learning units.	Upload Wednesday	Presentation Thursday	Comments
2.1	13/11	DMU & sales funnel Types busmodel + revenue model finance Guest lecture traction Pricing strategy (12, 13, WOO, Triggers, 15, 16)	15 november BS 23.00 uur Upload Preso: Midterm.	16 november Preso midterm (grade 25%)	A & C: Victor /Ron/Elif B & D: Tom/Johannes Cohort A en C: Echo Hall E Cohort B & D: Echo Hall F
2.2	20/11	Practicum DMU Sales; practicum busmod + revenue model + pricing	22 November BS 23.00 hrs Upload Doc: Testing the value proposition.		
2.3	27/11	Content Business Plan Guest speaker		1 december Exhibition prototypes TBM040a (subject to change)	
2.4	4/12	COSTS/COCA/Practicum/ template (19)			
2.5	11/12	Revenue model plus LTV (Template) (17, 18) Risks	13 December BS 23.00 hrs. UploadDoc: Designing the Businessmodel		
2.6	18/12	CF plus scenarios (I)	20 december BS 23.00 uur Upload Preso: Designing the Businessmodel	21 december Preso designing the businessmodel (grade21 december	B & C: Ron Lameij/Johannes D & A: Tom Dolkens/Elif Cohort B en C: Echo Hall E Cohort D& A: Echo Hall F
2.7	8/1	CF plus scenarios (II) Key assumptions plus questions (20, 21)	10 January BS 23.00 hrs Upload Doc: Testing the Businessmodel:		
2.8	15/1	Pitching Practices Plus dry Run (22, 23, 24 optioneel)			
2.9	22/1		24 januari 2024 BS 23.00 uur Upload Final preso	25 januari 2024 Final Preso (cijfer 10%)	All TPM Hall A
2.10	29/1		1 februari 2024 BS 23.00 uur. Upload hele businessplan	Businessplan (cijfer 20%)	

TBM026

2 ECTS

Q1

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Senior Lecturer **Elif Çelik** E.Celik@tudelft.nl

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Maartje Janszen m.a.janszen@student.tudelft.nl

Literature **Q2**

MANDATORY:

Rae, D., & Carswell, M. (2000). Using a life story approach in researching entrepreneurial learning: the development of a conceptual model and its implications in the design of learning experiences. Education + Training, 42(4/5), 220-228 Sarasvathy, S. D. (2001). Causation and Effectuation: Toward a Theoretical Shift from Economic Inevitability to Entrepreneurial Contingency. The Academy of Management Review, 26(2), 243–263. Entre-Comp Pocket Guide for Aspiring Entrepreneurs

RECOMENDED:

-Zero to one: Notes on startups, or how to build the future by Peter Thiel and Blake Masters -The Founder's Dilemmas: Anticipating and Avoiding the Pitfalls That Can Sink a Startup by Noam Wasserman -Founders at Work: Stories of Startups' Early Days by Jessica Livingston -Entre-Comp Pocket Guide for Aspiring Entrepreneurs -The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail by Clayton M. Christensen

-Who Says Elephants Can't Dance?: Inside IBM's Historic Turnaround

Introduction to Entrepreneurship (12E)

Rather than describing what it means to be an entrepreneur, in this course, you are required to experience (elements of) what it means to be one. To do that, you will work together with students from different faculties and get insights on what it means to create a successful team. Next to that, you will also be required to define and validate assumptions that can give you clear insights on the questions: "What kind of entrepreneur do I want to be (if any)?" and "Do I want to work in a big organization or a startup?".

Learning objectives

- Improve your knowledge on how to get the most out of working within a diverse team;
- 2. Explore why innovation (of e.g. technology, business model, meaning) fails so often;
- Clarify your passion(s) and self-knowledge, so that you can continuously create (entrepreneurial) opportunities that are a good fit with who you are and what you believe in;
- 4. Finally, this course helps you to become aware of the different paradigms (ways of thinking) that that exist when it comes to entrepreneurship and technology.

Educational approach

Lectures; workshops; case studies; guest speakers. The teacher(s) will coach you on an individual and team level throughout this elective. The lectures are organized as intensive week in the first week of the Minor, but the coaching and assigments will continue during Quarter 2.

12E

RECOMMENDED MEDIA CHANELS:

Y Combinator: https://www.youtube.com/channel/ UCcefcZRL2oaA_uBNeo5UOWg GaryVee: https://www.youtube.com/user GaryVaynerchuk Silicon Valley Girl: https://www.youtube.com channel/UCiq1FlgtEK7LRAOB1JXTPig https://effectuation.org/

> https://steveblank.com/ Podcast:

The Tim Ferriss Show (many interviews with highly inspiring entrepreneurs and scientists) – can be found on iTunes, Spotify or any other major podcast platform

Grading

Presentation Pass/Fail Portfolio Pass/Fail

Compulsory min 70% participation to lectures and coaching sessions.

You will receive concise (oral) formative feedback to help you achieve the goals you've set at the beginning.

To achieve all that, you are expected to develop a portfolio of your entrepreneurial learning and continuously reflect on it (and update it) throughout Quarter 1 and part of Quarter 2. You then submit interim and final reports at the end of each Quarter. The submitted reports serves as an underlying 'evidence' of your development.

Exams and testing

- 1. The course is graded as fail and pass. The grading is based on
- 2. 1. Participation to team coaching sessions and final team report on team learnings and dynamics (40%)
- 3. 2. Interim report on self-reflection on individual entrepreneurial competences, team competences and your own role (20%)
- 4. 2. Final report on self-reflection on individual entrepreneurial competences, team competences and your own role (40%).

Resit

Late filing of the deliverables without a valid reason will lead to a fail. To successfully complete the course, you need to pass all of its components. In all other cases, an extra assignment is to be completed before the end of the minor. The assignment will be defined based on the components that the student has failed.

Intro week I2E planning

Competencies	opportunities: Getting out the	Introduction
Break	building and	
Team's role in startup success	and mind to spot	
& fail	opportunites	
Break		
Entrepreneurial Ecosystem	Team formation activity	
Lunch Break	Walk and Meet Lunch Break	Lunch Break
Speed	Team formation	Mini DTW - Intro
etworking	activity	and challenge
	Break	Break
	Guest lecture on	Mini DTW -
	startup team	Emphatize Interviewing
Break		Break
Pre-minor		Mini DTW -
urvey & Your		Emphatize Interviewing
Journey		
이국 더 국민국민 이 제공 비 중 만만 폭탄 수 하나 쪽탄 것	Break Team's role in startup success & fail Break Entrepreneurial Ecosystem Speed networking Pre-minor survey & Your Entreprenurial Journey	n Break

TBM016A

4 ECTS

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Q2

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Senior Lecturer Victor Scholten

Literature 8

Recommended:

Grading

Teaching **Methods**

addition we will work on classroom quest speakers. The course is Each session consists of a mix of the course, you must study the within a team of two students. delve further into the topics and themes of the class.

Q1|Essentials of Entrepreneurship (EoA)

Essentials of Technology-Driven Entrepreneurship highlights a number of key aspects such as how does a good idea emerge, what is the role of intellectual property rights, of technology development, and we gain an understanding of the role of entrepreneurial ecosystems that support the growth phases of newly established startups. We discuss how entrepreneurs operate in networks, how they benefit from these networks and how they make decisions in such networks. We will discuss different models and methods with the goal of applying them so that you become more resilient as an entrepreneur.

Learning objectives

- Students can understand the dynamics of setting up a new business. the context, forms and risks and opportunities involved in entrepreneurship;
- 2. Analysing the complexity and context of a startup in which it is set up and understand how this affects the growth of the new business;
- 3. Students will develop skills for evlauating business opportunities, understanding customers and stakeholders, analyzing the market, valuing new technologies and choosing the right organizational model

Assesment & grading

The course is assessed based on two components; 1. Two team assignments (40%) during the lectures 2. An individual exam (60%). In normal circumstances, the exam is an openended closed-book question (in person, on campus) and a 3-hour multiple-choice exam. In unforeseen circumstances, the exam will be in the form of an online (digital) open book & timed open question and multiple-choice exam of 3 hours.

TBM041A

4 ECTS

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Senior Lecturer **Tom Dolkens** T.L.Dolkens@tudelft.nl

Literature 8

No book needs to be purchased for this course. All materials are provided on Brightspace.

Grading

Group project 100%

Students will be tested by marketing approach of their own business case. The case is a group assignment where they will have to formulate a strategic marketing plan.

Business Marketing for Engineers

Business marketing is an introduction to the basic principles of marketing for technopreneurs. The main purpose of this course is to generate an initial interest in, familiarize and encourage you in applying fundamental marketing concepts and models. By the end, you will understand what marketing for large organizations means, and you will be able to place it within the supply chain. You will also be introduced to the latest concepts and challenges within this field. Especially the basic understanding of Business-to-business (B2B) marketing, broader understanding of the market, customers, buying behaviour, market research and forecasting, pricing strategies and organizational marketing communication is the focus of this profession.

Learning objectives

- 1. The student will be able to identify the relevance of marketing and supply chain management.
- 2. Analyze and identify potentials within fundamental marketing processes and organizations.
- Identify and thereby differentiate on their basis of relevance to the enterprise.
- 4. Identify and value the relevance of marketing performance and customer performance identify and appreciate.

Eductional approach

This course flanks the Case Study and will ask you to apply the knowledge gained to your project. The course relies heavily on your own initiative and follows the 'reversed teaching" principle. Be curious, read the news, read books and watch presentations. Interactivity is key to a successful completion of the course. If you don't engage, then progression is not guaranteed.

TPM040A

4 ECTS

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Senior Lecturer **Priyanka Harish** p.harish@tudelft.nl

Literature 8

To be announced

Grading

- The course has 3 grading
 - Weekly in-close
 - assignments 12
- Jury assessment during 13
 - Prototype **14**

Product/Service Design and Prototyping

In this course, you will ideate, prototype and validate your solution concept. We will follow the book "Testing Business Ideas: Field Guide for Rapid Experimentation by Alexander Osterwalder and David J Bland". We will also make use of various methods, tools and techniques to aid in your product/service development (such as Assumptions Table, Morphological Analysis, Risk Analysis etc.). In addition, this course will also have guest lectures to bring more insight into product design and prototyping.

Learning objectives

- To conduct primary market research (minimum 10 interviews) with stakeholders (end-users, government employees, business owners etc.) to validate the problem faced by the customer -
- Design 10 conceptual solutions as product/ service ideas for the identified problem using morphological analysis
- 3. Build a prototype of the winning concept to test with end-users in a real-world setting
- 4. Design a validation study for the built prototype to test and receive feedback from at least 3 end-users
- 5. Evaluate the feedback to draw reasonable conclusions on the product/service ideas

Grading

The course has 3 grading components :

- Weekly in-class assignments
- Jury assessment during the final presentation
- Prototype

TBM020C

4 ECTS

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Senior Lecturer 5
Ben Wagner@tudelft.nl 7

Literature 8

No book needs to be purchased for this course. All materials are provided on Brightspace.

Grading

Group project 40% Indiv. Exam 60%

Resit

For both the individual exam and the group assignment must be a 5.75 or higher be achieved in order to count towards the final grade. Groups that do not achieve a 5.75 or higher - or who did not meet the deadline - may make a retake appointment with th teacher. In the retake mey not be higher than a 6.

Managing Startups

When technology startups launch a product, process or service into the market, they face a variety of management issues. For example, issues related to organizational structure, human resource management, group dynamics, leadership and power. During this course, students will learn what specific risks and opportunities startups face on the management front for example, compared to more traditional organizations. Students learn how to mitigate risks and exploit opportunities can take advantage of.

Learning objectives

- Students can distinguish and recognize different types of organizational structures. They can describe the risks and opportunities of startups compared to other (types of) organizations.
- 2. Students are able to describe the risks and opportunities of startups with respect to human resource management (e.g., attracting, retaining and letting go of employees). Also are able to formulate strategies to reduce HRM risks and capitalize on opportunities.
- 3. Students can describe the group processes that can occur in startups and what the risks and opportunities of these processes are for job performance. They can formulate strategies to reduce these risks and exploit the opportunities.
- 4. Students are able to identify leadership styles and name the advantages and disadvantages of these styles.
- 5. Students are able to classify and identify different types of power.

Educational approach

- Scientific and popular articles and videos
- Lecture slides

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TBM042A

3 4 ECTS 4

Senior Lecturer 5 Aleksander Giga 6 7

> Literature 8 To be announced

Grading

We cover finance tools and concepts that are essential to an entrepreneur when creating a financing strategy. We go over the techniques for setting up and evaluating a financial model and cover the principles of sound financial management. We study fundraising strategy and the entrepreneurial finance industry: the sources of startup funding (e.g. Venture Capital), motivations of entrepreneurs and investors,

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and negotiations and contracts between

Finance

them. We also explore latest developments in entrepreneurial finance (e.g. crowdfunding).

This course focuses on startup financing.

Learning objectives

- 1. Learn how to be a good steward of your business and critically assess financial viability of a business model;
- 2. Know where you can obtain funds for your business, thetrade-offs with each funding source, and how it fits yourbusiness model;
- 3. Become well-versed in fundraising strategy;
- 4. Master or review fundamental concepts in finance.

Educational approach

The material is illustrated through a combination of lectures, case studies, in-class exercises, and discussions. Depending on the availability and scheduling, we may host guest speakers, either entrepreneurs or investors, to share their experience directly related to the course material.