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## ENTRE 541 A/B: ENTRE PRACTICUM

### *Technology Commercialization*

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Quarter:	Winter 2023, 1/3/2023 - 3/9/2023
Class Hours:	Tuesdays & Thursdays, 1:30 -3:20 PM, Paccar 395
Credits and Grading:	4 credits
Course Website:	<a href="https://canvas.uw.edu/courses/1612734">https://canvas.uw.edu/courses/1612734</a>
Course Zoom Room:	<a href="https://washington.zoom.us/j/7212974154">https://washington.zoom.us/j/7212974154</a>
Office Hours:	Tuesdays & Thursdays, 12:30 PM - 1:00 PM, DEM 202G and by appointment
Instructor:	Lisa Hjorten, lhjorten@uw.edu, 425 591-7330
TA:	Ritwika Majumdar, <a href="mailto:ritwika@uw.edu">ritwika@uw.edu</a> , 206-756-5068

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#### COURSE SUMMARY

Each year thousands of innovations are discovered within industry, academia and research institutions yet only a handful ever make the complete path from idea --- to product ----to market --- to satisfactory financial return. Technology Commercialization (ENTRE 541) provides graduate students with the opportunity to work with UW scientists and engineers to identify potential applications, markets and business models for breakthrough discoveries invented at the University of Washington. The course is focused on building student skills with commercial analysis --- requiring research, critical thinking, and informed speculation regarding the risk/reward of commercializing an early-stage technology.

**For Winter 2023, the course will feature technology projects that support Social Justice, Clean Tech and Climate Change.**

You can see [the list of technologies here](#).

Initially you will be self-selecting the technologies that are of interest to you, ranking them from 1 to 3 in order of interest. On the first day of class, we may ask you to move to your second or third choice to balance the number and skills of students on each team. If you already have a team formed around a technology, please contact and get permission from the instructor at least two weeks prior to the first class. In some circumstances, student teams may be permitted to work with a technology that they are developing or already familiar with. Again, please discuss and get permission as far in advance as possible.

The research and analysis conducted by students in this class will be centered on six key questions that represent the key steps in the commercialization process:

- Technology Evaluation: Is the technology novel, competitive, and --- if appropriate --- protectable?

- Possible Solutions/Applications: Can a compelling solution be created that solves real and substantial user and customer needs?
- Possible Markets: What is the nature of the market where we might bring a solution and how might we enter it with the highest chance of success?
- Making money: Is there a profitable new business or license revenue stream to be had? What business model might be the first to test?
- Assembling a plan: What key commercialization milestones must be completed to improve the odds of a successful new business or license?
- Funding the plan: How will the plan be funded by private or public sources?

Students will answer these questions for a UW invented or supported technology and prepare a feasibility plan that contains an assessment of the underlying technology, a proposed product/solution that incorporates the technology, a conceptual business model for a business that could generate a reasonable return, and a roadmap of milestones needed to move the venture forward.

In addition to working on a feasibility plan, students may learn, apply and share key concepts taught in the course to their own business experience.

This is a four (4) credit course and the expectation is that students will spend *at least ten hours a week* on combined class time and independent research. There will be time allotted in most class sessions to work with your team and get feedback from the instructor and mentors.

All students will be required to sign a [UW Confidentiality Agreement](#) and must pledge confidentiality regarding their own and classmates' projects. If you have a "conflict of interest" you must explain it in writing. If we do not receive written notification of such a conflict, we will assume that none exists. Conflicts of interest may come from students analyzing companies/technologies they are working with, on, in their labs, in a work setting, or on behalf of their professors.

#### PREREQUISITE & LEARNING OBJECTIVES

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This course is designed for students who have a strong interest in exploring the process of transforming innovative new technologies into marketable products and services. It is not a traditional lecture and note-taking course but one that involves significant hands-on work as part of a team.

Upon completion of this course, students will be able to:

- Understand the commercialization process and gain firsthand experience working with a UW invented technology and researchers to scope possible commercialization paths.
- Understand approaches to conducting primary and secondary research to support a commercialization hypothesis.
- Understand business models --- and create a feasible business model for a solution incorporating the new technology.

- Gain experience working with a project team to divide up tasks, agree on an approach, and develop the plan.
- Gain experience developing and scoping project milestones.
- Gain experience presenting a business concept and feasibility plan to others.

#### TEXTBOOKS AND READING MATERIAL

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There are no required textbooks for this course. All reading materials will be available online through Canvas. Students are expected to read or view all materials before class and be prepared to engage in related discussions.

#### CLASS FORMAT

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Students are expected to attend and participate in all class meetings (unless pre-arranged with the instructor) and to spend the appropriate time needed to research their technologies and prepare for class assignments. This course will include multiple individual student deliverables, team deliverables and updates, and a final team deliverable (feasibility plan and presentation).

Classes will consist of short lectures, guest speakers, team time, feedback sessions, and delivery of individual and team assignments. Because of this, class attendance is critical to participation in the learning experience and is required aside from circumstances related to illness or a critical work event with your employer that cannot be rescheduled. If you are not able to attend a particular class session, please email me in advance. Regardless of the rationale, please note that you are responsible for the learning experience that takes place in your absence and please work within your team to address any material you may have missed.

All written assignments will be due on the date scheduled. Papers will be graded on content and style, with content typically providing approximately 70% of the overall grade. Content includes the quality of information and conclusions, support for conclusions, and the logic and flow of the information presented. Style includes grammar, spelling, punctuation and word usage.

#### PERFORMANCE MEASUREMENTS & GRADING

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<b>Professionalism and Participation</b>	<b>100 points</b>
<b>Individual Mini-Assignments</b>	<b>100 points</b>
<b>Team Updates &amp; Deliverables</b>	<b>500 points</b>
<b>Final Team Report &amp; Presentation (Team)</b>	<b>300 points</b>
<b>TOTAL Points</b>	<b>1000 points</b>

80% of your grade will be based on team results so working together as a cohesive team is critical to success in this class. If you are having any problems with team interactions and division of labor, please

contact your instructor as soon as possible. If you wait until the final team assessment to bring up issues it will be too late for a course correction.

The Class Professionalism and Participation points will be determined based on a number of factors:

- Attendance and Punctuality:  
The class is all about participation. Missing class will negatively impact both you and your team. In the unlikely event of online classes, they will require video-on participation.
- Professional Behavior in Class:  
Inappropriate cell phone use, excessive socializing, inappropriate dress during presentations, and lack of attentiveness are some examples of behaviors that can cause this score to drop.
- Participation in Class:  
Asking questions that move the class discussion forward, giving your best effort to every activity, being prepared for and asking relevant questions of guest speakers and visiting speakers and mentors.
- Team Assessment:  
Much like a 360-degree review in a company, there will be a team assessment survey near the end of the class that will weigh heavily on this score.

#### CLASS SCHEDULE AND WORK PLAN

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This 4-credit course requires approximately **10-12 hours** of work per module; it starts off lighter but will increase in intensity and preparation time ahead of the final team presentations. Please expect to spend more time during those modules which include larger assignments.

All classes are in-person unless changes are made due to Covid protocols, instructor illness or special team work-days. Check Canvas for announcements and details as we proceed through the course. *Guest lecturer and mentor schedules may change so patience and flexibility is appreciated.*

There will be time in most classes to work together as a team and get feedback on your plans but preparation in advance will help you make the most of this time. Do not rely on it as the only time to meet and work with your team and prepare your work products. It is advisable to create a team work schedule at the beginning of the quarter with days, locations and meeting times to ensure that everyone can contribute equitably to the project.

The course schedule and work plan **are subject to change** so please stay tuned to Canvas. All updates, announcements, assignments, and class materials will be posted in Canvas.

Module	Class Dates	Topics	Assignments Due, Guest Speakers Details on Canvas
1	1/3 & 1/5	<b>Introductions &amp; Overview</b> <ul style="list-style-type: none"> <li>- Course Overview</li> <li>- Personal Elevator Pitch</li> <li>- Project Selection &amp; Team Formation</li> <li>- Understanding the Technology</li> <li>- What is CoMotion, I-Corps, and Technology Commercialization?</li> <li>- Team Time – Intros, planning, &amp; who does what?</li> <li>- Team Time: Plan &amp; prepare for Researcher meetings, Send out team introductions</li> </ul>	<ul style="list-style-type: none"> <li>- Prepare/Due: 1 min personal elevator pitch</li> <li>- Prepare/Due: Tech Project Selections</li> <li>- Prepare: Readings on Canvas</li> <li>- Prepare: Questions for Guest Speakers</li> <li>- Guest: <b>Judy Bridges</b>, CoMotion</li> <li>- Due: UW Confidentiality Agreement</li> </ul>
2	1/10 & 1/12	<b>First Steps to Commercialization</b> <ul style="list-style-type: none"> <li>- Developing a Research Plan</li> <li>- Identifying potential customers</li> <li>- Leveraging publicly available resources incl. UW/Foster Library</li> <li>- Primary &amp; Secondary Research</li> <li>- Team Time</li> </ul>	<ul style="list-style-type: none"> <li>- Prepare: Questions for Guest Speaker</li> <li>- Guest: <b>Amanda Pirog &amp; Jessica Jerrit</b>, UW/Foster Library Resources</li> <li>- Due 1/12: Team Charter</li> </ul>
3	1/17 & 1/19	<b>Determining the Value Proposition</b> <ul style="list-style-type: none"> <li>- Team Update #1: PI meetings &amp; Technology</li> <li>- Lean Business Model and Value Proposition</li> <li>- Team Assignment: Cloverleaf Analysis</li> <li>- Team Time: Work on Team Update #1</li> </ul>	<ul style="list-style-type: none"> <li>- Prepare: Questions for Speaker</li> <li>- Guest: <b>Ken Myer</b> - 1/19, The Lean Canvas &amp; Value Proposition</li> <li>- Due 1/20: Cloverleaf Assessment</li> <li>- Extra Credit due 1/21 or later</li> </ul>
4	1/24 & 1/26	<b>Customer Discovery</b> <ul style="list-style-type: none"> <li>- Who is your customer?</li> <li>- Interviewing to confirm customer problem/need</li> <li>- Working on the Lean Canvas</li> <li>- Present Team Update #1 in class</li> <li>- Team Time</li> </ul>	<ul style="list-style-type: none"> <li>- Prepare: Questions for Speaker</li> <li>- Guest: <b>Mike Robinson</b>, Customer Discovery</li> <li>- Due 1/26: Team Update #1</li> </ul>
5	1/31 & 2/2	<b>Funding the Company</b> <ul style="list-style-type: none"> <li>- Panel Discussion: Angel Financing, Venture Capital, Grants</li> <li>- Alternative Financing (SBIR, etc.)</li> <li>- Team Time</li> </ul>	<ul style="list-style-type: none"> <li>- Prepare: Questions for Panel</li> <li>- Guests: <b>Bill McAleer</b>, Voyager Capital (VC); <b>Kathryn Gardow</b>, (Angel Investor), <b>Meher Antia</b>, WRF Capital (Grants, SBIR) - 1/31</li> <li>- Guest: <b>Igor Novosselov</b>, Grant applications</li> <li>- Guest: <b>Steve Hinton</b>, opportunities with Tribal Nations</li> </ul>
6	2/7 & 2/9	<b>Crossing the Chasm</b> <ul style="list-style-type: none"> <li>- The Innovation Adoption Lifecycle</li> <li>- Guest Speaker from A-Alpha Bio, "Tips from the Trenches"</li> <li>- Team Time &amp; Team Feedback</li> </ul>	<ul style="list-style-type: none"> <li>- Guest: <b>Tom Kippola</b>, Chasm Group</li> <li>- Prepare: Questions for Speaker</li> <li>- Guest: <b>David Younger</b>, A-alpha Bio,</li> </ul>
7	2/14 & 2/16	<b>Intellectual Property</b> <ul style="list-style-type: none"> <li>- Overview of patents &amp; the patent process</li> <li>- How to avoid getting caught in a patent battle</li> <li>- Researching patents on a startup budget</li> </ul>	<ul style="list-style-type: none"> <li>- Prepare: Questions for Speaker</li> <li>- Guest: <b>Vijay Kumar</b>, Perkins Coie LLP</li> <li>- Due: Team Update #2</li> </ul>