

**Course Syllabus**
ver. 2.2**ISEN 498 Energy & Sustainability Project Practicum**

Spring 2021

Northwestern University

Instructor / Faculty Advisor: Holly Benz, Clinical Associate Professor, McCormick School of Engineering**Class Timing:** Spring 2021; Tu, Thu 2-3:20pm (typically Tuesday is lecture, Thursday is team meeting day but this will vary over the course of the quarter with many of the lectures being concentrated in the first 2-3 weeks) March 30 – June 12, 2021; “Northwestern Monday” makeup will be 4-5:30pm on Tuesday, March 30; Team kick off meetings will be on the week of March 30 (x3) and the week of April 5 (x3)**Class Location:** Zoom; Tech L211**Office Hours:** By appointment; Calendly**Course Synopsis**

This class is a practical course focused on experiential learning. It is targeted to students who are passionate about energy & sustainability and are seeking real-world project experience. The course is almost solely centered on a 10-week, team-based consulting project for a corporate, non-profit or government partner of Northwestern University. Student teams will be advised by the instructor but will work directly with the client organization. There will be limited traditional reading / lecture content and the topics covered will include project management and team collaboration.

Course Details

The projects are pre-selected by the instructor and will be tailored each year to match both market trends and student interests. High level project preferences will be collected from MSES students in Fall Quarter and once projects are confirmed, students can rank their preferences for the projects in late Winter Quarter. All projects will have a clearly defined scope and deliverables and the projects will include economic, technical and regulatory / policy aspects to the analysis. The projects will vary and could range from a government sponsored project about electric vehicle infrastructure to a new market entry analysis for a corporation in circular economy to building a sustainable water strategy for a food manufacturer.

This course will be offered in the Spring quarter each year and seats will be offered ONLY to MSES students. Due to the involvement of clients and the need to ensure teams are properly resourced, the class cannot be dropped or projects changed once the Spring quarter has started ([March 30, 2021](#)). This is a required course for all MSES students to ensure that they build skills in strategy, project management and formal presentation. Students will study the concepts and then apply them in the real world via project experience. In the future, other graduate students interested in energy & sustainable business may request this course but currently, it will be offered only to the MSES cohort.



Master of Energy & Sustainability Program *Project Practicum*

Selected partners will have the opportunity to propose a 10-week spring project (March 30 – June 12, 2021). Sponsor will get a chance to have a key strategic question reviewed. Students will bid for projects offered by a variety of sponsors. Projects should be substantial and cover the three pillars of technology, regulatory / policy and economics / finance.

**Commitment:**

- Provide topics, agree scope and offer direction
- Weekly meetings with team
- Provide feedback on midpoint deliverables
- Attend final project presentation (ideally in person)
- Cover any pre-approved, project-based expenses for students

Description:

- Each team (estimated 5-6 teams) will select a topic based on options provided by Master's program administration
- Partner will be asked to offer 2 topics of interest and the faculty leader will select one
- Scope & deliverables will be drafted by partner and NU faculty with refinement during project
- Team will work independently but there will be an interim check in at 5 weeks with partner contact and a final presentation of all deliverables at 10 weeks

Benefits:

- Low cost way to address important (but under-resourced) projects
- Get to know emerging graduate level talent
- Offer opportunity make external connections with thought leaders in academic environment

Timeline

- Jan 2021 - Sponsor to provide topic / scope
- Feb / Mar 2021 – Teams selected / pre-work shared
- End March / early April 2021 – Team kickoff meeting
- May 2021 – Midpoint check in
- June 2021 – Final deliverable presented

Team

Faculty Advisor

Student Team (4-6 Students)

Sponsor Project Lead

While this course is for credit, students should treat it as a professional project with a “real” client. Most clients schedule a weekly conference call and the class time on Thursday can be used for the client call and / or team meeting. A meeting of the project team and the faculty advisor may happen in addition to (and in advance of) that call. The entire team is expected to normally participate in each meeting in a timely and prepared fashion, though other work is normally divided up between team members. The meeting times are flexible, however, it is your responsibility to schedule team meetings and to organize work as necessary.

Course Goals

- Provide “on the job” training on how to successfully manage and deliver a project
- Offer exposure to leading companies / organizations
- Ensure teams have strong project management skills and have put them to the test
- Hone problem solving abilities
- Improve formal presentation skills and collaboration
- Learn to work successfully in teams
- Test ability to consider economic, technical and policy aspects of a problem / opportunity
- Demonstrate aptitude to craft a compelling business case

Format

- Work directly with corporate, government or non-profit client
- Includes individual, team and client facing work
- Requires clearly defined scope (agreed and sharpened with client and instructor in Week #1)
- Regular (weekly) meetings with team, client and instructor
- Mid-term progress presentation (to class & client)
- Final presentation (to class, client & other NU stakeholders)



Project Assignments

All students interested in the course must apply for projects (in rank order) **by the due date provided in March**. All students will be advised of their project assignment by **before Spring Quarter begins** they will be provided with a confidentiality agreement to sign. Once returned signed via email, the student will be introduced to his / her team and will be provided access to background information for that client. Some example projects include:

- **City Government**: Assessment of EV infrastructure in an urban area and recommendations on how to ensure regulatory policies promote equitable, economically attractive and technically feasible deployment of EV charging infrastructure (L2, L3 charging)
- **Microgrid Company**: Understand and update the value proposition for microgrids for an infrastructure and solutions player entering the “energy as a service” (EAAS) space
- **Food Retailer**: Evaluate opportunity to expand “circular economy” offering in grocery space. Perform market segmentation, assess cost impacts and recommend next steps. Consider attractiveness vs. other product innovations competing for scarce capital
- **Water Company**: Conduct customer interviews and market research to determine the appetite for increased water efficiency programs, top targets to deploy efficiency offers, key messaging and value proposition to focus on. Estimate cost / benefit to launch water efficiency as recommended.

Students may also be allowed to propose their own project if it meets the course objectives and a suitable client sponsor will commit to the requirements of ISEN 498.

The Role of Faculty Advisor (Instructor)

Teams are expected to manage their project independently with the client project lead. The faculty advisor’s role is to help you structure and solve problems, to help avoid and remove roadblocks, to intervene in the case of major conflicts within the team or with the client, and to suggest appropriate resources, such as experts and materials applicable to the project. Your team must serve as the project manager but the instructor will work to support you with appropriate resources. The student team, however, is responsible for the project, its deliverables and the communications of the team. The faculty advisor participates in major communication with the client and meets with the team regularly during office hours.

Lecture Sessions

This course is mostly comprised of independent and team-based project work along with regular project meetings with both the client and the faculty advisor. In addition to the project-based work, there will be several class lecture sessions and several presentation workshops (x2 for midpoint presentations, x2 for final presentations). Lecture content will cover three main topics: strategy concepts, project management skills and communication / presentation fundamentals. The intent is to provide student with tools to deliver a better result in their consulting project and to practice using the tools in advance of entering (or re-entering) the professional world. Most of the instructor led lecture sessions will take place in the first half of the course.

Expenses

Client organizations are expected to cover any project related expenses, such as travel, international calls, or purchase of data or reports, if necessary. Please get pre-approval for expenditures and verify expense policies directly with client.



Course Grading:

Grading will be based on the following:

Component	Weight	Details	Due
Strategy Quiz	10%	Quiz on strategy (concepts from selected readings from HBR "On Strategy, apply them to your project)	End of Week #1
Project Plan	10%	Build a project plan based on initial project description, client kickoff / input and April 6 exercise (and any revisions): <ul style="list-style-type: none"> • Workplan with detailed scope / task (iterated based on exercise and client meeting) • Dependencies • Critical Path Analysis • Stakeholder Overview – who and map to matrix 	End of Week #2
Presentation Outline	5%	Teams should submit (in advance of their meeting with the instructor) a 1-2 page Word outline of their "storyboard" for the presentation; this is not graded on quality of outline but completeness (that is, did the team fully complete the exercise). Teams should build the outline for their FINAL presentation but note which items will be reviewed at the midpoint	Week #4/5
Midpoint Presentation	20%	Intermediate readout by teams on results to date (40 min each, x6) <ul style="list-style-type: none"> • 60% of grade from instructor, 40% based on client rating • Uses presentation rubric 	Week #5/6
Final Presentation	40%	Final readout by student teams on project (70 -80 min each, x6) <ul style="list-style-type: none"> • 60% of grade from instructor, 40% based on client rating • Uses presentation rubric 	Week #9/10
Peer Rating	10%	Students will be graded (on a 10-point scale) by their team peers; the simple average of team mate scores will be used; each team member has a fixed budget of points to allocate (8 per team member) <ul style="list-style-type: none"> • Fails to meet most or all expectations - 2 • Meets some expectations - 4 • Meets most expectations - 6 • Meets all expectations - 8 • Exceeds some expectations – 10 • Exceeds all expectations – 12 (this is a 120%) <p><i>An initial rating + anonymous comments will be provided at the midpoint to ensure that students have a chance to improve on their team behaviors over the course of the class</i></p>	Week #6 & #11
Providing Presentation Feedback	5%	All students will be required to attend each presentation and provide same day feedback on peer presentations at the midpoint & final presentation; <i>Failure to provide same day feedback will result in a zero for this assignment; grade is for giving feedback; peer feedback in presentation rubric (same as client/instructor but does not count toward team grade – meant to be constructive and helpful)</i>	Week #5/6 & #10/11

**Required Readings:**

Instructor will assign a selection of texts below.

- HBR “On Strategy”. Harvard Business Review’s Must Reads. 2011.
 - Porter, Michael E. “What is Strategy?” Harvard Business Review. 1996.
 - Porter, Michael E. “The Five Competitive Forces that Shape Strategy?” Harvard Business Review. 1996.
 - Collins, James C. and Jerry I. Porras. “Building Your Company’s Vision”. Harvard Business Review.
 - Kim, W. Chan and Renée Mauborgne. “Blue Ocean Strategy”. Harvard Business Review. 2004.
 - Neilson, Gary L. , Karla L. Martin and Elizabeth Powers. “The Secrets to Successful Strategy Execution” Harvard Business Review.
 - Rogers, Paul and Marcia Blenko. “Who has the D?” Harvard Business Review.
- Videos: [Detailed Scoping](#), [Critical Path Analysis](#). “Fundamentals of Project Planning & Management”. [Yael Grushka-Cockayne \(@grushkay\)](#), Associate Professor of Business Administration, University of Virginia, Darden
- Course Presentation: “Project Management Toolkit”
- Calkins, Tim. “How to Wash a Chicken: Mastering the Business Presentation. September 25, 2018.

Optional Readings:

These readings are NOT required for the course. They are simply listed for students who would like to dive deeper on specific topics.

- Strategy
 - Ovans, Andrea. “What is Strategy Again?” Harvard Business Review. May 12, 2015.
 - Milton Friedman (1970), “The Social Responsibility Of Business Is To Increase Its Profits”, New York Times Magazine, September 13.
 - Douglas Beal, Robert Eccles, Gerry Hansell, Rich Lesser, Shalini Unnikrishnan, Wendy Woods, and David Young. “Total Societal Impact: A New Lens for Strategy” BCG, October 25, 2017.¹²
- Project Management / Teams
 - Full Course on Coursera. “[Fundamentals of Project Planning & Management](#)”. [Yael Grushka-Cockayne \(@grushkay\)](#), Associate Professor of Business Administration, University of Virginia, Darden
 - Lencioni, Patrick. The Five Dysfunctions of a Team: A Leadership Fable. 2002.

¹ <https://www.bcg.com/publications/2017/total-societal-impact-new-lens-strategy.aspx>

² <https://www.forbes.com/sites/bobeccles/2017/10/25/total-societal-impact-is-the-key-to-improving-total-shareholder-return/#3f72282c2113>

- Lencioni, Patrick. The Ideal Team Player: How to Recognize and Cultivate The Three Essential Virtues. May 2016.

Project Summary:

Each client will draft (and review with the instructor in advance of the course) a project summary (~1-3 pages) that includes the following:

- **Organization Overview** – Mission, Size, History, Current Operational Areas, Revenue / Other Indicator of Scope, # of employees, typical customer base
- **Market Background** – Size of market, key players, major trends
- **Problem Statement** – Outline of the challenge or opportunity your organization wants to address or learn more about
- **Project Description & Scope of Work** – Overview of the major activities the team should engage in 3-8 bullets plus any relevant details
- **Deliverables** – List of the work product the team should provide at the end of the project; include deliverable format (Powerpoint, Word Document etc); offer any guidance on expectations of length / depth of analysis to be provided

Additional information may be appended as deemed relevant. These summaries will be made available to prospective students interested in registering for the courses and should be used to set priorities on project preference.



Class Schedule:

Class will meet (on average) for two 80 min sessions per week, however, many class times will be dedicated to team working sessions. Please note that additional sessions will be required for finals and all students are required to attend all midpoint and final presentations. From 2-3:30pm CT on June 1,2,3,8,9 and 10, all students must be present, in-person for final presentations unless an exception is arranged with the instructor.

Weekly Topic	Description	Description
1: Course Overview, Strategy & Project Management (week of March 29, 2021)	Lecture: Intro to Course, Project Management <ul style="list-style-type: none"> Discuss course expectations Overview of Project Management, Workplanning, Dependencies, Critical Path & Stakeholders 	Lecture: Strategy <ul style="list-style-type: none"> Student Poll on personal goals for course & “bucket list” Discussion of key concepts from reading Discussion: “Warm call” group breakouts on strategy <ul style="list-style-type: none"> Review of projects (if time allows)
2: Workplanning (week of April 5, 2021)	Working Session: Build workstreams, tasks, dependencies & critical path (in-class exercise)	Discussion: Individuals and teams review feedback (30 min)
3: Project Work Time (week of April 12, 2021)	<ul style="list-style-type: none"> Working Time – No Class April 12 special session office hours 	<ul style="list-style-type: none"> Working Time – No Class
4: Presentations Skills & Midpoint prep (week of April 19,2021)	<ul style="list-style-type: none"> Lecture: Guest Speaker, Effective Business Presentation, Tim Calkins (Kellogg) “How to Wash a Chicken” (60 min) 	Working Session: No Class; Team Midpoint Reviews (as scheduled, in-person); <i>possible presentation coaching session (x3 teams)</i>
5: Midpoint Prep & Presentations (week of April 26, 2021)	Working Session: No Class; Team Midpoint Reviews (as scheduled, in-person); ; <i>possible presentation coaching session (x3 teams)</i>	Midpoint Presentations (x2, 40 min) <ul style="list-style-type: none"> Clients will attend individual sessions; All ISEN 498 students will attend and provide written feedback on all presentations to observe, learn from & support classmates and their clients
6: Midpoint Presentations (week of May 3,2021)	Midpoint Presentations (x2, 40 min)	Midpoint Presentations (x2, 40 min)



7: Acting on Feedback <i>(week of May 10, 2021)</i>	Lecture: Guest Speaker, David Baker , Pritzker Private Capital (Bain, Andersen) Managing Feedback, Agility & Adaptability (60 min) Discussion: Individuals and teams review feedback (30 min)	Discussion: Warm call groups to reflect on feedback in the context of stakeholder power / interest matrix (60 min)
8: Project Work Time <i>(week of May 17, 2021)</i>	<ul style="list-style-type: none"> Independent team work Client call Instructor Office Hours (use calendly) 	<ul style="list-style-type: none"> Independent team work Instructor Office Hours (use calendly)
9: Project Work Time <i>(week of May 24, 2021)</i>	<ul style="list-style-type: none"> Independent team work Client call Instructor Office Hours (use calendly) 	<ul style="list-style-type: none"> Independent team work Instructor Office Hours (use calendly)
10: Final Presentations <i>(week of May 31, 2021)</i>	<ul style="list-style-type: none"> 3 days (80 min each) – June 1, 2, 3 from 2-3:20pm CT in Tech 211 <i>It is expected that these sessions will be in-person (but following all COVID protocols)</i> <i>80 minute team slots – 50 minutes presentation, 25 min Q&A</i> <i>Clients will attend individual sessions; some other faculty and stakeholders may attend</i> <i>All ISEN 498 students will attend all presentations to observe, learn from & support classmates and their clients</i> 	
11: Final Presentations <i>(week of June 7, 2021 - FINALS)</i>	<ul style="list-style-type: none"> 3 days (80 min each) – June 8, 9, 10 from 2-3:20pm CT in Tech 211 <i>Final online peer rating for team mates will be due by 4pm CT on Thursday, June 10th.</i> 	

About the Instructor

Ms. Benz is a Clinical Associate Professor at the McCormick School of Engineering and Applied Sciences and Director of the Master of Science in Energy & Sustainability Program (MSES) at Northwestern University. She teaches graduate level courses at Northwestern and is responsible for all aspects of the MSES program including staff, budgets, faculty, courses, facilities, and initiatives, Holly has worked in the energy & sustainability space in executive roles (VP, SVP) since 2005:

- CLEARResult (2016-2018)
- Schneider Electric (2010-2016)
- Centrica / British Gas / Direct Energy (2005-2010)



In her professional roles, Ms. Benz has led strategy for \$6-16B divisions of international energy companies, managed P&Ls including a team of 225 electrical engineers. Before working in the Energy sector, Holly was a strategy consultant with Bain & Company in the UK and worked in Andersen Consulting's Internet Center of Excellence in the US, Brazil and Argentina. She speaks Spanish and Portuguese. Holly obtained her MBA at The Wharton School and earned an MA in International Studies at The Lauder Institute at the University of Pennsylvania. She is a graduate of Northwestern University, where she majored in economics.

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Northwestern University Policies & Resources:

Academic Integrity

Academic integrity is taken very seriously at Northwestern. Students are responsible for reading and understanding Northwestern's Academic Integrity policies. All suspected violations will be reported to the McCormick College of Engineering's Dean's Office. These include: cheating, plagiarism, fabrication, unfair advantage, unauthorized collaboration, and aiding and abetting of academic dishonesty. Students found in violation of academic integrity may receive a zero on the assignment or a failing grade for the course, and may be suspended or permanently expelled from the University. See [Academic Integrity: A Basic Guide](#) for more information.

AccessibleNU and Disability Accommodations

Any student requesting accommodations related to a disability or any other condition is required to register with AccessibleNU (847-467-5530) and provide professors with an accommodation notification from AccessibleNU, preferably within the first two weeks of class. All information will remain confidential. See the [AccessibleNU website](#) for more information.

Illness and Medical Leave of Absence

Review the University's [policy](#) on missing academic work due to illness. Your instructor cannot waive an assignment missed due to illness unless she can verify your illness with Health Services.



Discrimination and Sexual Harassment

Northwestern's Policies on Discrimination, Harassment, and Sexual Harassment apply to all members of the University community, including students, staff, faculty, and third parties. Any student, staff, faculty member, or third party who believes that they have been discriminated against or harassed on the basis of their race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, pregnancy, parental status, marital status, age, disability, citizenship, veteran status, genetic information or any other classification protected by law, should contact the Office of Equity at (847) 467-6571. Additional information about the University's discrimination and harassment policies, including the campus resources available to assist individuals with discrimination or harassment concerns, is available online on the [Office of Equity Website](#). Students, staff, and faculty who report harassment, discrimination, or sexual misconduct are also protected under the [University's Policy on Non-Retaliation](#).

Sexual Misconduct and Reporting

Northwestern University is committed to fostering an environment where students are safe and free from sexual misconduct. [Confidential resources](#) are available to those who have experienced sexual misconduct. Faculty and instructors are not confidential resources and are required to report incidents of sexual misconduct, whether discussed in your assignments or in person, to the Office of Equity, which can provide information about resources and options. We encourage students who have experienced sexual misconduct to talk with someone to get support. For more information, including how to request interim protective measures and academic accommodations or file a complaint, see the [Get Help page](#).

Other Resources

Students can find useful resources for safety and security, academic support, and mental and physical health and well-being at the [NUhelp website](#).