iCons 2 Renewable Energy (i2e) | NatSci 289H – Sec. 2
Integrated Scientific Communication

Spring 2020 Syllabus (version 2, 2/3/2020)

iCons 2 Energy Instructional Team:
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iCons 2 Energy Place/Time: ISB 329, Tues/Thurs, 11:30am-12:45pm

iCons 2 Energy Office Hours: Goessmann 222, Tues/Thurs, 1:00-2:00 pm; and by appointment.

iCons 2 Energy Description: The Integrated Concentration in Science (UMass iCons) Program is a 20-credit certificate available to all majors in science, technology, engineering, and math (STEM) at UMass Amherst. iCons students take iCons 1 in the spring of their 1st or 2nd year, learning problem-solving, teamwork, and communication attitudes and skills, while applying STEM concepts and skills to tackle real-world problems. In the second year of iCons, each student cohort splits into two tracks: Renewable Energy and Biomedicine/Biosystems, with a different section of iCons 2 for each track. The focus of iCons 2 is honing the attitudes and skills of effective 360° communication — communicating clearly and persuasively with: (i) STEM workers in one’s own field, (ii) STEM workers in other fields, and (iii) non-STEM workers. Communication in i2e is considered broadly as reading, writing, speaking, discussing, and debating on issues relevant to current problems in renewable energy. Each student tailors i2e to their interests and needs by choosing their own set of learning goals upon which their progress will be measured, and their own set of renewable energy problems that pique their interests. In Spring 2020, we have a golden opportunity to “green” the energy infrastructure of campus through the UMass Carbon Mitigation Challenge (CMC). The overall objective of iCons 2 Energy in Spring 2020 is thus to successfully pitch a project to the UMass Carbon Mitigation Taskforce to help bring UMass Amherst to net-zero carbon emissions by the year 2030.

iCons 2 Energy Overall Course Structure:

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<tr>
<th>Component</th>
<th># of Weeks</th>
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<tbody>
<tr>
<td>Communication Bootcamp with Reflection</td>
<td>5</td>
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<tr>
<td>Mid-Term Proposals with Reflection</td>
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<tr>
<td>Extended Case Study Project with Reflection</td>
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iCons 2 Energy Real-World Objectives:
- **This i2e class:** To pitch an innovative and compelling carbon mitigation project to the UMass Chancellor’s Carbon Mitigation Taskforce at the UMass 2020 Energy Forum.
- **Previous i2e classes:** To propose an innovative and engaging sustainability project to the Sustainability Innovation & Engagement Fund. (Note: you can still do this; deadline is Feb. 14, 2020; check out the website; ask your instructors and read below for help on this.)
**iCons 2 Energy Learning Goals:**
Here you can tailor your i2e experience to your particular needs and aspirations by choosing your own learning goals, like ordering food from a menu in a restaurant. At a minimum, you must choose three (3) goals, including Goal 1 if you want this course to count for Junior Year Writing. Each goal choice has the following form, where you fill in the blanks of your choices:

- **You will learn to (... fill in blank ...) on Clean Energy problems.**

**Goal Area #1 – Writing** (each student *must* choose this for i2e to count as Jr Year Writing)
1. … write clearly and persuasively ...

**Goal Area #2 – Other Communication Skills**
2. … speak clearly and persuasively …
3. … create clear and persuasive visual presentations …
4. … communicate clearly and persuasively with both scientists and non-scientists …

**Goal Area #3 – Other Problem-Solving Skills**
5. … synthesize economics, environmental, & social concerns with technical arguments …
6. … work collaboratively and synergistically in teams …
7. … exert leadership over your own investigations …

**iCons 2 Energy Communication Products / Semi-Detailed Schedule:**

- Communication Bootcamp (all individual communication products):
  - Personal Statement / Resume / LinkedIn ..... week 1
  - Abstract with PPT Slide / Speech ............... weeks 2-3
    - Reflection writing (1 pg)
  - Research Paper ........................................... weeks 3-4
    - Reflection writing (1 pg)
  - Student Choice Revision ........................... week 5
- Mid-Term Proposal Panel: ............................. week 6
  - All: <1pg Proposal with Figure
  - Some: 1 PPT Slide and Talk
    - Reflection writing (1 pg)
- Extended Team Case-Study Project:
  - Position Paper ....................................... weeks 7-12
  - UMass CMTF Pitch .................................... week 13
- Overall Reflection on i2e ............................ week 14

**iCons 2 Energy Grading Criteria:** Student progress monitored for chosen goals:
- Substantial Progress in ALL chosen goals: ......................... A
- Substantial Progress in writing AND another goal: .............. A-
- Substantial Progress in one goal, AND overall strong effort: .... B+
- Substantial Progress in one goal, OR overall strong effort: .... B
- Some Progress in a goal, OR overall strong effort: ............. B-
- No Progress in any goal, with occasional effort: .............. C+
- No Progress in any goal, AND little-to-no effort: ................ C
- No Progress in any goal, AND negative attitude: ............... D
- No-show: .................................................................. F
Junior Year Writing: This course is qualified by the Faculty Senate Writing Committee to satisfy the Junior Year Writing requirement for participating majors. For more information on participating majors, please consult the Instructor.

- Pre-requisites: iCons 1 and College Writing (ENG 112) are the pre-reqs for iCons 2.

Suggested Writing Style Handbooks:

- Purdue Online Writing Handbook: https://owl.english.purdue.edu/owl/resource/747/08/

Detailed Course Schedule (subject to change, students will be apprised of changes ASAP)

Week 1: Launch i2e with Goal Setting – Campus Carbon and Personal Goals
Personal Statement (500 words), Resume (1pg), LinkedIn Profile (60 words) due by Jan 23
(Engage in Reverse Design: Career → College → Course)

1. Tues Jan 21: Frame i2e w/CMC & Personal Goals
2. Thur Jan 23: Assign iCons Student Success Survey
   (https://umassamherst.co1.qualtrics.com/jfe/form/SV_9WDdlvUyUMR9DpP);
   Workshop on Elements of Good Personal Statements / Resumes / LinkedIn Profiles ...
   (11:59, Michael Franti & Spearhead)

Week 2: Reading Inception and Writing Abstracts
Read TWO articles; write Abstract for ONE of them: Tentative Article Topics = Campus Carbon / Campus Heating Plant / Campus Building Energy / Greening Ball St – Jan 28
Write Abstract (500 words) due Jan 28, Revision due Jan 30

3. Tues Jan 28: Discuss Article/Core meanings/Needed science in affinity teams; Peer Review of Abstracts ...
   (Who Are You?, The Who)
4. Thur Jan 30: Peer Review Abstracts; SMA Thermo Lecterette; Students bring/discuss Examples of Good+Bad Slides ...
   (Unwritten, Natasha Beddingfield; Drive My Car, The Beatles)

Week 3: Making Powerpoint Slides and Giving Short Talks
Stick with same article; Make Slide / Give Short Talk on Articles due Feb 4

5. Tues Feb 4: Student slides / talks / peer evaluations ...
   (Under Pressure, Queen & David Bowie)
6. Thur Feb 6: Last Speech(es), Generative Interviews for Post-Speech Reflections, Begin Research for Report ...
   (Sound of Sunshine, Michael Franti & Spearhead)

Week 4: Researching / Writing an Individual Research Report (IRR)
IRR Version 1 on Student-Chosen Topic (1000 words) due Feb 13

7. Tues Feb 11: Revisit/Declare i2e Learning Goals, IRR Messaging Document due; Peer review; Continue research (music)
8. Thur Feb 13: IRR Version 1 due ...
   (Exodus, Bob Marley & the Wailers)

Week 5: Begin Researching Extended Project Proposal – End of Bootcamp
IRR Version 2 on Student-Chosen Topic (1000 words) due Feb 20
9. Tues Feb 18: ISF RFP; Discussion of proposals – goods and bads – create proposal rubric; Begin research on topics for extended projects ...
   (music)
10. Thur Feb 20: IRRv2 due; Research on extended projects; Scale check ... (music)

**Week 6: Midterm Proposal Panel**
- Written Proposals (375 words) due on Feb 25
- Slide / Talk for Chosen Proposals due on Feb 27
  - 11. Tues Feb 26: ISF Review Panel (Prof. D Venkataraman) ... (Happy, Pharrell)
  - 12. Thur Feb 27: Top Half talks; Announce Funded Projects (Reflection) ... (Landslide, Fleetwood Mac) (Profs. Ben Weil and Dwayne Breger)

**Week 7: Extended Project Begins / iCons 1 Pitches**
- Team Pitches to iCons 1 for Recruiting due Mar 5
  - 13. Tues Mar 3: New Teams; Revisit Learning Goals; Scaffold Project (Problem, Solution Tech, Implementation, Pros/Cons); Prep for iCons 1 Pitches (Push It, Salt ‘n Pepa)
  - 14. Thur Mar 5: iCons 1 Pitches; Teamwork on problem statements (Legalize It, Peter Tosh)

**Week 8: Extended Project Continues – Problem Statement**
- Each Team writes a Problem Statement (750 words) due on Mar 10
- Each Team sends 1 member to give Chalk Talk (8-10 mins) on Problem due on Mar 10
  - 15. Tues Mar 10: Problem Statement 8-10 min chalk-talks due – Scale Checks (music)
  - 16. Thur Mar 12: Research on Solution Technology Explainers – Scale Checks (music)

**Week 9: Extended Project Continues – Solution Technology**
- Each Team writes a Solution Technology Explainer (750 words) due on Mar 24
- Each Team sends 1 member to give Chalk Talk (8-10 mins) on Sol-Tech due on Mar 24
  - 17. Tues Mar 24: Solution Technology Explainer 8-10 min chalk-talks due (music)
  - 18. Thur Mar 26: Research on Implementation Explainers – Scale Checks (music)

**Week 10: Extended Project Continues – Implementations**
- Each Team writes an Implementation Explainer (750 words) due on Mar 31
- Each Team sends 1 member to give Chalk Talk (8-10 mins) on Implement. due on Mar 31
  - 19. Tues Mar 31: Implementation Explainer 8-10 min chalk-talks due – Scale Checks (music)
  - 20. Thur Apr 2: Research on Pros/Cons

**Week 11: Extended Project Continues – Pros/Cons**
- Each Team writes a Pros/Cons Explainer (750 words) due on Apr 7
- Each Team sends 1 member to give Chalk Talk (8-10 mins) on Pros/Cons due on Apr 7
  - 21. Tues Apr 7: Pros/Cons Explainer 8-10 min chalk-talks due – Scale Checks (music)
  - 22. Thur Apr 9: Discuss pitches – Goods and Bads; Discuss Structure of Position Paper (music)

**Week 12: Practice Pitches**
- Extended Project Proposal Document due Apr 16
  - 23. Tues Apr 14: Practice pitches (Reflection) (music)
  - 24. Thur Apr 16: Practice pitches (music)

**Week 13: UMass Energy Forum – Project Pitches**

**Week 14: Final i2e Reflection**
1. Tues Apr 28: Final Reflection – Generative Interviews (music)

Appendix I: Inventory of Inception/Reference Materials:

UMass Carbon Mitigation and Energy Inception Materials – TBD ASAP

Energy Learning Goals
- Converting among various Energy Units (Joule, Calorie, …) / Power Units (Watt, etc.)
- Kinds of Work (mechanical, gravitational, electrical, chemical, …)
- Typical Energy Densities for Different Sources
- Energy Conversion Efficiencies
- Environmental Impacts of Energy Conversion, Storage, and Utilization (pollution, climate change)
- Economics of Energy Conversion, Storage, and Utilization
- Social Impacts of Energy Conversion, Storage, and Utilization
- Business Aspects of Energy Conversion, Storage, and Utilization
  - Market adoption opportunities & barriers
  - Bringing new technologies to market

“Communication Product” Inception Materials
- Example of Abstract/Article: SMA JACS
- Example of Figure: DV JPC
- Example of Slide: iCons Assessment slide
- Example of Op-Ed: David Brooks NY Times, SMA Huffington Post
- Example of Letter-to-Editor: SMA NY Times
- Example of Letter-to-Policy: Einstein to FDR

Reference Materials / Resources
- UMass Amherst Physical Plant “Sustainability Initiative” (Ezra Small, Craig Nicholson)
- Energy Flow Diagrams

Typical Reflection Questions
- What were the biggest challenges in completing the assignment?
- How well did your group work as a *team*?
- Did you yourself learn what you expected to?
- Did you reach your expectations?
• If given an opportunity to do assignment again, what would you do differently?
• What communication “best practices” emerged?

Sustainability Innovation and Engagement Fund (SIEF) Application Details:
• Get Started:
  o Visit: https://www.umass.edu/sustainability/campus-living-student-activities/idea-funding/sustainability-innovation-engagement-fund-sief, scroll down to find link for “APPLY HERE.”
• Personnel:
  o Plug in contact info for Student lead, and Faculty sponsor (this should be somebody who is an expert on the kind of solution you propose, not necessarily Prof Auerbach)
• Project Info:
  o Enter “Project Title” and “Project Description” (no obvious word limits, but do keep it as brief as possible)
  o Answer “What are your goals and objectives for the outcome of this project?” I think they mean: are you hoping to teach/engage students, make money, green campus? All of the above?
  o Enter “Timeline of your project”
  o Answer “Has the related department or organization endorsed this project?” and related fields. To make sure the answer is YES, please email Ezra Small (Campus Sustainability Manager, esmall@facil.umass.edu) to find out which is the relevant campus department or organization, and whom to contact to move your idea towards endorsement.
• Project Budget
  o To the best of your ability, estimate how much this project will cost. (Dollars)
  o Amount Requested
  o Expenses
  o What are the monetary benefits of implementing this project (e.g. avoided costs or savings per year)?
  o Have you pursued or received other sources of funding for this project? Are you currently pursuing other sources of funding? (Please list sources of funding with amounts, as well as attempted proposals for funding.)
• Miscellaneous
  o Is there anything else about your project that you want us to know?
Appendix II: Student Contract (Retain this copy for your records)

Please initial before each statement, acknowledging that (i) you have carefully read the syllabus, and (ii) you understand your responsibilities in this course and the way your work will be evaluated. Please sign the bottom of the sheet and return it during the next class meeting. We will not record any grades for you until we have your initialed/signed contract.

I have carefully read and understood this entire syllabus.

I will adhere to the highest standards of academic honesty.

I will attend every class unless I am ill or have extraordinary circumstances.

I understand how my performance will be evaluated, and how my grade will be earned.

I know that help is available to me outside of class through (1) instructor office hours, (2) other experts at UMass Amherst and beyond, and I will seek that help if I determine such help is necessary.

Name: ______________________________________  Student ID Number: ____________

Signature: ____________________________________