# PHYS3800: The Future of Sustainable Building ONLINE COURSE SYLLABUS SPRING 2020

Course: PHYS3800 (3 credits)
Dates: March 2 – April 18, 2020
Location: Online
Instructor: Joseph Harney, M.S
Email: harneyj@wit.edu
Availability: By email, and conference call by appt.

## TEXT AND REQUIRED MATERIAL

Text: Sustainable Energy: Without the Hot Air, David JC MacKay, UIT Cambridge England (Free
electronic version available online)

Material:Excerpts and examples from current affairs and selected readings (Will be posted on Blackboard)

Blackboard: [Access your Blackboard course through this link.](https://wit.blackboard.com/)

## BOOKSTORE INFORMATION

Location: Beatty Hall Flanagan Campus Center, 103 Ward Street Boston MA 02115
Telephone: 617-445-8814
Website: [Purchase your text through Wentworth bookstore competitive rates linked here.](https://www.bkstr.com/wentworthitstore/home/en?cm_mmc=Redirect-_-VanityURL-_-thewitshop.com-_-10364)

## COURSE DESCRIPTIONThis course introduces the students to the current energy systems used in industry at both the corporate and societal levels. Students will learn the shortcomings of both AC and DC power generation with respect to current technologies. Today’s power delivery methods will be identified, and calculations of batteries, capacitors, and petroleum energy densities will be compared. After a base line of understanding is fully grasped, topics will include climate change, and therefore sustainability will be incorporated to take an in depth look at the economic and environmental feasibility of new technologies such as fuel cell, biodiesel, fission and fusion.

## COURSE OUTCOMESUpon completion of this course students will be able to:

1. Predict theoretical energy outputs and storage capacities of various technology, and find efficiencies compared to company specs.
2. Comprehend the economic implications of adopting new technologies vs. maintaining conventional electrical/heating systems.
3. Demonstrate an ability to identify and solve building constraint problems keeping to MA building codes.
4. Evaluate and calculate energy demands of the built environment, big and small.
5. Identify the pros and cons of interfacing each technology, new or existing, into homes and transportation.
6. Identify political propaganda, and better deduce motivations from corporate advertising.

## METHODOLOGY

This is an online course. Teaching methods include, and not limited to, lectures, slides, discussions, assignments, group activities, problem solving, case studies, literature review, and research projects posted within the Blackboard course site. Each week, students are expected to:

* Review the week’s checklist.
* Review the Lecture(s).
* Complete the Reading(s).
* Participate in the Discussion Question(s).
* Complete all Learning Activities.
* Complete the Assignment(s)
* Complete the Assessment(s).

## GETTING STARTED

To get started, you must read the entire syllabus. All students are asked to introduce themselves as a welcome activity on the first day of class.

Student success in this online class depends on student active participation. Class participation is required and involves meeting required discussion and learning activity deadlines. Let the professor know immediately if there are any difficulties with this.

## COMMUNICATION

All assignments should be submitted through Blackboard. Feedback is provided to you in the Gradebook each Wednesday. Class communication is posted to the discussion forum so all students can benefit from each other’s learning. I check my email and discussion boards daily and provide feedback on the work there. I respond to emails and postings within 24-48 hours. If you need help on an assignment and you have not heard from me in that time frame, please contact me.

I also put any updated course information, changes or responses to questions that all students need to know about on the *Announcements* page so check this regularly. The Announcements also go to your *Wentworth email*. Make sure you check your Wentworth email regularly. You can have it *forwarded to your personal email* account. For assistance, call the Help Desk (617-989-4500).

## CLASS PARTICIPATION

Class participation and contribution are essential. You should read all assigned materials and view all videos. Not all material is included in the discussions but they are used throughout the course for a variety of activities. Assignments must be submitted on time, unless you have obtained prior approval from the instructor beforehand. Keeping up with the workload allows you to learn as well as to contribute to your classmates’ learning.

Participation in the discussion board is essential. Each student is expected to post a primary response to the discussion question(s) **by Thursday** at midnight and a minimum of two secondary responses to a classmate’s posting **by Sunday** at midnight. Check the discussion board daily as people post early.

The discussion boards should be a forum for lively, thought provoking conversations that provide an opportunity for every voice to be heard. Listen carefully to one another. Watch for ideas or opinions that intrigue you. Don’t forget to ask clarifying questions when you don’t understand or need more information. Experiment with new ideas. That’s what an educational experience should encourage you to do. Let your curiosity be stoked by the variety of responses from the members of your class. Your participation significantly contributes to your course grade.

Your discussion posts should:

* Be substantive and clear, following the directions and responding to all questions in the assignment
* *Refer to at least one theory or idea* from class material
* *Cite* any sources or quotes referenced using APA format
* Be proof-read and *edited before submission* to ensure clarity
* Include a subject line and a signature—every subject line should be updated for each post
* Both follow-up posts should include a question to deepen the discussion
* Be focused—about 100-200 words in length. Wordy posts are difficult to follow. Overly short posts do not provide enough specific information to be meaningful. Strike a balance by making sure you have included all the information required by the discussion board directions.
* A discussion rubric is provided below and in the course in Blackboard.

## CPCE UNDERGRADUATE DISCUSSION RUBRIC

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| --- |
| QUALITY OF DISCUSSION POSTS |
| **CRITERIA** | **MISSING OR SERIOUS PROBLEMS** | **BELOW EXPECTATIONS** | **MEETS EXPECTATIONS** | **EXCEEDS EXPECTATIONS** | **EXEMPLARY** |
| **INITIAL RESPONSE** Relevance to discussion topic*Weight 30%*  | **0%**Contributions are off-topic or distract class from discussion.  | **60**%Contributions are sometimes off-topic or incomplete.  | **70**%Contributions are relevant.  | **85**%Contributions are relevant and encourage others to engage.  | **100**%Contributions are relevant and promote in-depth analysis of material.  |
| **INITIAL RESPONSE** Originality and references*Weight 15%*  | **0%**No response submitted.  | **60**%Responses are not original OR do not include references to course material to support points made.  | **70**%Responses are original and include at least one reference to course material.  | **85**%Responses are original and well thought out and include references from the course material. These materials are integrated into the response to display advanced learning.  | **100**%Responses are original and well thought out and include references to material beyond what is provided in the course. This material is integrated into the response to display mastery learning.  |
| **RESPONSES TO OTHERS** *Weight 25%*  | **0%**No response to others are evident.  | **60**%Responds to only one student’s initial post.  | **70**%Responses to two students’ initial posts. Responses not well developed and/or do not include both questions and comments. | **85**%Responses to two students’ initial posts are well thought out and replies to your own post are developed with questions and comments.  | **100**%Well-developed, engaging responses that reply to more than two student answers and reply to student responses to your own post.  |
| MECHANICS |
|  | **Missing or Serious Problems** | **Below Expectations** | **Meets Expectations** |
| **Grammar and Style** *Weight 15%* | **0%**Response is not submitted. | **60%**Response needs additional work to meet academic standards and include APA formatting. | **100%**Well-developed, professional message using APA formatting and in-text citations. |
| **Frequency** *Weight 10%* | **0%**Student did not post or respond.  | **60%**Student responded to the discussion question on only one day which was a response to another student or faculty member.  | **100%**Student responded to the discussion question on two separate days. The initial post plus two responses to others were observed. |
| **Timeliness***Weight 5%* | **0 %**No posts or responses were submitted on time. | **60%**Only initial post OR responses were on time. | **100%**All posts and responses were submitted on time. |

## NETIQUETTE—COMMUNICATION COURTESY

In an online course we are creating a community of learners who are collaborating to enhance their own learning and the learning of others. Therefore, it is essential that all communications in discussion boards, chats, emails or group forums be polite, respectful and reasonable. Creating respectful dialogue is an essential skill for every aspect of our lives. Hopefully our experience in this online course will help to improve those skills. Here are a few helpful guidelines that everyone will benefit from:

* Positive comments go a long way to facilitate a conversation
* Descriptive comments rather than evaluative (I’m right, you’re wrong) are more likely to engage another student
* Don’t make disagreements personal, focus on the content
* Avoid sarcasm, be curious, try to understand a different perspective
* When you don’t understand the response of another student, ask clarifying questions, be aware of assumptions (yours and other persons) and ask questions to test them out
* Think about and review your post before you submit
* Checking the discussion threads frequently and responding appropriately and in a timely manner.
* Focus on one subject per message and use pertinent subject lines in your emails and discussion thread postings.
* Capitalize words only to highlight a point or for titles - capitalizing otherwise is generally viewed as SHOUTING!
* Be professional and careful with your online interactions with classmates and instructors.
* Cite all quotes, references, and sources appropriately.
* When posting a long message, it is generally considered courteous to warn readers at the beginning of the post that it is lengthy.
* Don't forward someone else's messages without their permission. This is considered rude, so always ask first.
* Students may use humor, but they should use it carefully. The absence of face-to-face cues can cause humor to be misinterpreted as criticism or flaming (i.e. angry, antagonistic criticism).

## ACADEMIC ACTIVITY AND PARTICIPATION POLICY FOR ONLINE COURSES

Given the asynchronous format of online and hybrid courses, students have the opportunity to take part in the class at multiple times during each weekly module. It is recommended that students login to their online/hybrid course, at minimum, 4–5 times per week to participate in discussion boards, read materials, take assessments, and submit assignments. Active participation in online courses is required and is often graded by the instructor.

To be considered active, students will be expected to login to their online or hybrid course(s) in the Blackboard Learning Management System (LMS) and participate in at least two (2) “Academic Activities” each week:

* At least one Academic Activity by midnight ET Wednesday each week.
* At least one additional Academic Activity by midnight ET Sunday each week.

“Academic activities” includes any combination of the following:

* Posting to discussion boards within the online course.
* Turning in an assignment within the online course.
* Taking a quiz, test, or other assessment within the online course.

A student who is unable to take part in a given week’s activities must contact the instructor prior to any assignment deadlines. Makeup work is accepted at the discretion of the instructor. Students should plan accordingly and make sure to read the schedule of deadlines listed in the course syllabus.

## LIBRARY SERVICES

Students can receive assistance with research and citations as well as secure materials from the library. For a full list of hours and services [please see the library website at this link](http://library.wit.edu/about/visit).

BLACKBOARD HELP DESK AND TECHNICAL QUESTIONS

For Blackboard support during regular business hours please call our Help Desk at 617-989-4500 and say "Blackboard" when prompted. For 24/7 support students [should visit this website for the Online Support Center and Browser Test.](http://wit.echelp.org/%22%20%5Co%20%22Online%20support%20and%20browser%20test%20website)

## ACADEMIC SUPPORT

The Center for Academic Excellence facilitates Wentworth students’ academic success and helps them to achieve their full learning potential.  Students may choose to receive individual assistance through one-on-one tutoring in many subjects, including math, science, writing, and major classes.  In addition, the Center for Academic Excellence offers Facilitated Study Groups (FSGs), tutor-led study tables, academic workshops, and learning-strategy consultations.  The peer-tutoring program is certified by the College Reading and Learning Association’s International Tutor Training Certification program. To make an appointment or to review our drop-in offerings, please visit www.wit.edu/cae.  For additional assistance or support on subjects not listed, please reach out via email to cae@wit.edu.

## ACADEMIC HONESTY STATEMENT

Students at Wentworth are expected to be honest and forthright in their academic endeavors. Academic dishonesty includes cheating, inventing false information or citations, plagiarism, tampering with computers, destroying other people’s studio property, or academic misconduct” (Academic Catalog). See the catalogue for a full explanation.

## STUDENT ACCOUNTABILITY STATEMENT

All work should be submitted through the course site as a permanent record. Assignments should be done in Excel or Word, in APA format. No late work is accepted without prior approval, if approved will be accepted at a 10% reduction in value for each week late. No late work will be accepted for or in Week 7.

Plagiarism and cheating is not permitted. Students who are caught cheating will receive a zero for the assignment and may receive a failing grade for the entire course. See the Student Handbook for more information about plagiarism and cheating.

## CENTER FOR WELLNESS AND DISABILITY SERVICES STATEMENT

College can be challenging and it is common to feel overwhelmed or stressed at times.  If these feelings are related to course work or academic performance, please talk to me.  For more significant mental health concerns, the **Center for Wellness and Disability Services (003 Watson Hall, 617-989-4390)**provides free and confidential mental health counseling.

If you or someone you know needs support around thought of suicide, the following resources are available:

* Center for Wellness and Disability Services, Watson 003, 617-989-4390, M-F 8:15-4:45
* Campus Police, First level of 610 Huntington Avenue, 617-989-444, 24/7
* Samaritans, call or text 1-877-870-4673
* Crisis Text Line, text “start” to 741-741
* National Suicide Prevention Lifeline, call 1-800-273-8255
* GLBT Youth Hotline, call 1-866-488-7386
* Beth Israel Deaconess Emergency Room, 190 Pilgrim Rd Boston, MA

Students requiring academic accommodations must provide an official accommodation memo from **the Center for Wellness and Disability Services** and contact me privately to discuss logistics.

**ASSIGNMENTS AND GRADING**

**Course Site/Website**: Weekly homework assignments, quizzes and midterm will be posted onto Blackboard. I will post solutions to all assessments after everyone has completed them. Everything will be announced VIA email should things need to change, or questions need to be addressed. It is the student’s responsibility to visit the course site regularly to ensure that they are aware of the most current postings. You are also advised to regularly check your e-mail for announcements.

**Assignments/Submitted Work/Late Work:** All submitted quizzes and homework must be handed in by Sunday unless otherwise announced or noted in the course website. Late assessments will only be accepted at the discretion of your instructor and CPCE. All submitted written assignments for this course must meet the Standards for English I. Poorly written work will be returned to you, without a grade, for revision. The students are encouraged to utilize the Writing Center facility for help polishing their papers.

## **Midterm and Final Presentation:** There will be a midterm and a final presentation. The midterm will require you to log in to the testing section of Backboard in order to submit. This will be during week 4 and will consist of all materials that we have covered. The final presentation will be posted onto blackboard for week 7. We will agree upon a technology throughout the weeks, and you will be graded on progress. You will also be required to read, comment and provide peer feedback on the other final presentations.ASSIGNMENTS AND GRADING

Final grades will be determined solely by total points acquired during the semester. There are no extra credit opportunities.

The course total is **1000 points**, and the course grade is determined as follows.

* **5 Discussions** = 150 points (30 pts each)
* **2 Case Studies + 1 Writing Assignment** = 300 points (100pts each)
* **2 Quizzes =** 100 points (50pts each)
* **Midterm** = 200 points
* **Final Presentation Total (250 points)**
	+ **Consultation =** 25 points
	+ **Outline =** 100 points
	+ **Presentation =** 100 points
	+ **Peer Feedback =** 25 points

GRADING SCALE

|  |  |  |  |
| --- | --- | --- | --- |
| **Grade** | **GPA Weight** | **Point Range** | **Definition** |
| A | 4.00 | 930–1000 | Student learning and accomplishment far exceeds published objectives for the course/test/assignment and student work is distinguished consistently by its high level of competency and/or innovation. |
| A- | 3.67 | 900–929 |
| B+ | 3.33 | 870–899 | Student learning and accomplishment goes beyond what is expected in the published objectives for the course/test/assignment and student work is frequently characterized by its special depth of understanding, development, and/or innovative experimentation. |
| B | 3.00 | 830–869 |
| B- | 2.67 | 800–829 |
| C+ | 2.33 | 770–799 | Student learning and accomplishment meets all published objectives for the course/test/assignment and student work demonstrates the expected level of understanding and application of concepts introduced. |
| C | 2.00 | 730–769 |
| C- | 1.67 | 700–729 |
| D+ | 1.33 | 670–699 | Student learning and accomplishment based on the published objectives for the course/test/assignment were met with minimum passing achievement. |
| D | 1.00 | 600–669 |
| F | 0.00 | 0–599 | Student learning and accomplishment based on the published objectives for the course/test/assignment were not sufficiently addressed or met. |

The quality of your work is what drives your grade. Written assignments are graded on the thoroughness of your work, use of concepts from the class and materials, your ability to analyze the problem or situation, and your ability to apply the principles and lessons from the readings and lectures. Whenever possible, relate the course content to real-world applications and experiences to strengthen your transfer of knowledge from class to your work. Proofread your work carefully for spelling and grammar. Poor writing interferes with your ability to communicate your ideas.

All written work should be submitted meeting the Standards of English I. Poorly written papers may be returned ungraded for revision. All work should be proofed, typed in double space format with one-inch margins all around and 12-point type. Students are encouraged to utilize The Center for Academic Excellence for help polishing their written assignment.

Individual and group papers must be submitted through Blackboard. Each written assignment includes specific directions about the topic, issues to be developed and resources required. APA format should be used to cite source material. Check the Gradebook to check for feedback on your work and your grade. I may use tracking changes to provide detailed feedback so please make sure you open the returned paper to see my comments. Assignment instructions and grading rubrics are provided with success criteria for each assignment on Blackboard.

CPCE Undergraduate Assignment Rubric

**LEVELS OF ACHIEVEMENT**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Criteria**  | **Unacceptable**  | **Minimal**  | **Competent**  | **Effective**  | **Mastery**  |
| **Quality of assignment content** *Weight 70%* | **0%**Does not display an understanding of the associated learning objectives presented in assignment.  | **60%**Demonstrates minimal understanding of associated learning objectives presented in assignment.  | **70%**Demonstrates some understanding of the associated learning objectives presented in assignment.  | **85%**Demonstrates a general understanding of the associated learning objectives presented in assignment.  | **100%**Demonstrates a full understanding of the associated learning objectives presented in assignment. |
| **Mechanics and Readability** *Weight 15%* | **0%**Writing is unclear and/or disorganized in all literacy standards Assignment is not understandable to the reader Frequent errors in spelling and capitalization: profound and/or inaccurate punctuation which render the submission unreadable.  | **60%**Writing is unclear and/or disorganized in most areas of literacy standards Assignment is unclear and not understandable. Contains serious intrusive errors of grammar and spelling which partially inhibit readability. | **70%**Writing is unclear and/or disorganized in some areas of literacy standards. Assignment is partially clear and understandable. Contains several grammar and spelling errors, but does not inhibit readability.  | **85%**Writing demonstrates mastery of most criteria for high academic literacy standards Assignment is mostly clear and understandable. Contains only occasional grammar and spelling errors.  | **100%**Writing demonstrates mastery of all criteria for high academic literacy standards Assignment is clearly understandable. Free of grammar and spelling errors.  |
| **Structure, Organization, Format, AND Presentation** *Weight 15%*  | **0%**Submission inappropriate for assignment. Does not follow directions as indicated by instructor. References and citations are not included if requested. Thoughts are not expressed in a logical manner.  | **60%**Submission follows minimal directions and is missing many components indicated in the instructions. If requested, references are not included and/or properly cited. Errors in format interfere with meaning, formatting is weak.  | **70%**Submission does not follow all directions and is missing some components indicated in the instructions. If requested, some references are included and cited partially. Several errors in formatting or format is inconsistent. | **85%**Submission follows directions and includes most components indicated in the instructions. If requested, references are included and most cited properly. Few formatting errors.  | **100%**Submission follows directions and includes most components indicated in the instructions. If requested, references are included and cited properly. Very few formatting errors.  |

# WEEKLY SCHEDULE

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| --- | --- | --- | --- |
| **Week** | **Topics** | **Chapter Readings** | **Assignments** |
| Week 1(Start on 3/2) | Course Introduction: Individual and Societal Needs | MacKayChapters1,2,13 | * **Reading resource:** Survivalist Articles with discussion
* **Watch BB lecture series**
* **Discussion:** ‘What if there was no oil?’
* **Watch videos:** Tesla’s PowerWall press release + a clip from Al Gore’s Inconvenient Truth
* **Writing assignment: ‘**What is Really Needed’ with citations
 |
| Week 2 | Contemporary Power and Current Forms of Energy Distribution | MacKayChapters7,9,11,15 | * Select Presentation Topic on In-depth Emerging Technology
* **Reading resource:**  Calculating energy usage of the built environment with discussion
* **Watch BB lecture series**
* **Discussion**: ‘Utilities’
* **Watch videos** Ecology – Khan Academy + Crash Course
* **Quiz**
 |
| Week 3 | Electricity and Home Heating (Part I) | MacKayChapters17,18,23 | * **Reading resource:** Energy production
* **Watch BB lecture series**
* **Watch Videos:** TED Talks - The Earth is Full + Abundance is Our Future
* **Discussion**: How do you see our future?
* **Case study writing assignment:** Elon Musk **-** Tesla’s Power Wall energy scaleup ‘city design.’
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| Week 4 | Home Heating, Transportation and An Introduction to Renewables | MacKayChapter 3 +Technical Chapters D,E,H | * **Reading resource:** Geothermal Heating system
* **Watch BB lecture series**
* Check-in with Presentation Consultations
* **Midterm**
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| Week 5 | Current Market Green Technologies and The Economic Implications  | MacKayChapters 4,6,8,10,16 | * Presentation Outline Due
* **Reading resource:** Boston Risk Assessment
* **Watch BB lecture series**
* **Watch Videos:** Why the Cooling Challenge Matters + Solid State Cooling
* **Discussion:** Taking a guess at the future energy markets.
* **Case study writing assignment: book** Heat II
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| Week 6 | The Future of Energy | MacKayChapters21,22, 28 | * **Watch BB lecture:** Overview of Future Global Cities
* **Watch Videos:** Sustainable City, Biosphere 2
* **Discussion:** Habitats on Mars
* **Quiz**
* Reminder Final Presentations Due Next Week
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| Week 7(Last day 4/18) | Final Presentations | Further Case Study | * Final Presentations Due
* **Reading Resource:** Current affairs
* **Watch BB lecture:** Alternative Source
* **Discussion:** Peer Feedback on Presentations
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