

Fall 2018

# EVSC 715-851: Energy and Sustainability

Michael Bonchonsky

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**Energy and Sustainability, EVSC  
715: on-line course  
*Fall 2018 Course Syllabus***

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For course material go to moodle.njit.edu

Office: Tiernan 365 Hours: T / Th 10:00-11:30 and by appt

[NJIT Academic Integrity Code](#): All Students should be aware that the Department of Chemistry & Environmental Science (CES) takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the Instructor.

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## **COURSE INFORMATION**

**I. Course Description:** This course includes an interdisciplinary review of fundamental scientific principles necessary to understand basic energy systems. The course assesses current and future technological and engineered systems for processing and using different energy non-renewable and renewable sources with an emphasis on meeting our energy needs in a sustainable manner. The course will examine the social and environmental consequences of energy production, distribution, and use. Lecture modules will identify and evaluate various renewable and conventional energy production technologies, energy end-use practices and alternatives, and consumption practices in today's society.

### **II. Learning Outcomes:**

- Trace the historical and current contributions of energy systems to human progress
- Recognize principal patterns of energy transformations in the natural environment and anthro built environment
- Calculate the technical performance of energy systems: efficiencies, physical transport of heat
- Evaluate environmental implications of various forms of energy production including major contaminants and modes of mitigation
- Recognize and identify the technical fundamentals of fossil fuels in energy production
- Explain the technical fundamentals of the production of electricity from wind turbines, photovoltaic cells and solar thermal energy systems
- Identify and differentiate the technical formats of nuclear power systems and the environmental implications
- Analyze the New Jersey Energy Master Plan in the context of national energy policy development

**Number of Credits:** 3Cr

**Prerequisites:** Science foundation

**Course-Section and Instructors**

Course-Section	Instructor
EVSC 715 on line see moodle	Michael P. Bonchonsky

**Office Hours for All Chemistry & Environmental Science Instructors:** [Fall 2018 Office Hours and Emails](#)

**Required Textbook:**

Textbook: Sustainable Energy. Choosing Among Options: Second ed. Jefferson W. Tester, Elisabeth M. Drake, Michael J. Driscoll, Michael W. Golay and William A. Peters 2012; MIT Press; ISBN 978 0 262 01747 3

**University-wide Withdrawal Date:** The last day to withdraw with a W is Monday, November 12, 2018. It will be strictly enforced.

## **POLICIES**

**All CES students must familiarize themselves with, and adhere to, all official university-wide student policies. CES takes these policies very seriously and enforces them strictly.**

**Grading Policy:** The final grade in this course will be determined as follows:

- 1. Midterm examination (30%):** There will be a midterm exam comprised of multiple-choice or short-answer questions and brief essays. This exam will be based on course lectures, discussion sessions, and assigned readings. The midterm is scheduled as shown on moodle.
- 2. Final examination (30%):** There will be a final exam conducted during the end-of-semester exam period. The format of the final exam will be the same as the midterm exam; it will be based only on course material covered during the second half of the semester.
- 3. Class participation (15%):** Each week students are required to post an entry in the discussion forum for that week (200 word entries). This is important because it is your opportunity to post observations on the weekly material or to react to a classmate's posting. You are required to do this during each week by Sunday at 11:55pm (you can't go back after that week) for the full 15% of "class participation." Discussion posts are "all or nothing," so students will either receive full credit or no credit (1 pt will be given for each week scaled up to 15 at the end when fully completed).
- 4. Writing Assignment (25%):** One research paper will be required during the semester. The schedule for the assignments will be determined at the start of the semester (see the schedule on syllabus and in Moodle). Instructions for the assignments will be posted on Moodle prior to deadlines. All completed assignments must be submitted online on by 11:55pm on the day of the deadline.

## **V. Important Notices**

1. Students enrolled in this course are forewarned that the consequences of plagiarism or academic misconduct of any kind are severe. Violations will be handled in accordance with the rules outlined in the [Code of Student Conduct](#). If you are unfamiliar with these procedures, you should consult the appropriate section of this governing manual.

2. Please be sure to log into Moodle each week, listen to a lecture, check for assigned readings, and participate in the weekly discussion forum. From my end of Moodle, reports indicate to me when you enter and for how long at all times.

3. All quizzes and exams are closed book, closed notes, no aids.

The evaluation of student performance in this course is based on five components noted above.

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**Your are required to use Respondus for each on line test:**

### *Using Respondus LockDown Browser and a Webcam for Online Exams*

Respondus LockDown Browser is a locked browser for taking exams in Moodle. It prevents you from printing, copying, going to another URL, or accessing other applications during a test. If a Moodle quiz requires that LockDown Browser be used, you will not be able to take the assessment or quiz with a standard web browser. You may be required to use LockDown Browser with a webcam (Respondus Monitor), which will record you during an online exam.

**This course requires the use of Respondus LockDown Browser and/or Respondus Monitor with a webcam for the midterm and final online exams.** The webcam can be built into your computer or can be the type that plugs in with a USB cable. Watch [this short video](#) to get a basic understanding of LockDown Browser and the webcam feature. A student [Quick Start Guide \(PDF\)](#) is also available.

a) Download and install LockDown Browser from this link:

<http://www.respondus.com/lockdown/download.php?id=264548414>

b) Once your download has finished, locate the “LockDown Browser” shortcut on the desktop and double-click it. (For Mac users, launch “LockDown Browser” from the Applications folder.)

c) You will be brought to the Moodle login page within the LockDown Browser, click “Login with your UCID” to log in with your NJIT UCID and password and then click Login.

d) Under “My courses”, click on the course in which you have to take the exam that requires the LockDown Browser.

e) After you enter the course, find the exam and click on it.

f) A confirmation prompt will appear, click the “Start attempt” button. Once a quiz has been started with LockDown Browser, you cannot exit until the Submit all and finish button is clicked.

g) If you are required to use a webcam (Respondus Monitor), you will be prompted to complete a Webcam Check and other Startup Sequence steps.

4. Final grades are not subject to post-semester adjustment—with the exception of the amendment of a grading error.

Under no circumstances will students be given the opportunity to complete extra-credit papers or other assignments to bolster their final grades.

#### 5. Taking an online course at NJIT

This is an online course and all course work, lectures, and projects can be completed online in the Learning Management System, Moodle. Students are expected to use Moodle to interact with course content and engage with their classmates. Each week will include between 3-4 topics with an assignment per topic due every Sunday by midnight. For more information, see [FAQs for Online Courses at NJIT](#).

#### 6. Netiquette

Throughout this course, students are expected to be courteous of classmates by being a polite, active participant. Students should respond to discussion forum assignments in a timely manner so classmates have adequate time to respond to your post. Respect opinions, even those that differ from your own and avoid using profanity or offensive language.

Your final letter grade in this course will be based on the following:

Final Grade	Overall Academic Performance (100%)
A	Above 90
B+	85-89
B	80-84
C+	75-79
C	70-74
D	60-69
F	Below 60

**Homework Policy:** Homework is an expectation of the course. The homework problems set by the instructor are to be handed in and will be used in the determination of the final letter grade as described above.

**Exams:** There will be two midterm exams held in class during the semester and one comprehensive final exam. The following exam periods are tentative and therefore possibly subject to change:

Midterm Exam	October 14-21, 2018
Final Exam Period	December 15 - 21, 2018

The final exam will test your knowledge of all the course material taught in the entire course.

**Makeup Exam Policy:** There will normally be **NO MAKE-UP QUIZZES OR EXAMS** during the semester. In the event that a student has a legitimate reason for missing a quiz or exam, the student should contact the Dean of Students office and present written verifiable proof of the reason for missing the exam, e.g., a doctor's note, police report, court notice, etc. clearly stating the date AND time of the mitigating problem. The student must also notify the CES Department Office/Instructor that the exam will be missed so that appropriate steps can be taken to make up the grade.

**Cellular Phones:** All cellular phones and other electronic devices must be switched off during all class times. Such devices must be stowed in bags during exams or quizzes.

### ADDITIONAL RESOURCES

**Chemistry Tutoring Center:** Located in the Central King Building, Lower Level, Rm. G12. Hours of operation are Monday - Friday 10:00 am - 6:00 pm. For further information please click [here](#).

**Accommodation of Disabilities:** Office of Accessibility Resources and Services (*formerly known as*

**Disability Support Services**) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT.

If you are in need of accommodations due to a disability please contact Chantonette Lyles, Associate Director at the Office of Accessibility Resources and Services at **973-596-5417** or via email at [lyles@njit.edu](mailto:lyles@njit.edu). The office is located in Fenster Hall Room 260. A Letter of Accommodation Eligibility from the Office of Accessibility Resources Services office authorizing your accommodations will be required.

For further information regarding self-identification, the submission of medical documentation and additional support services provided please visit the Accessibility Resources and Services (OARS) website at:

- <http://www5.njit.edu/studentsuccess/disability-support-services/>

**Important Dates** (See: [Fall 2018 Academic Calendar, Registrar](#))

Date	Day	Event
September 4, 2018	T	First Day of Classes
September 10, 2018	M	Last Day to Add/Drop Classes
November 12, 2018	M	Last Day to Withdraw
November 20, 2018	T	Thursday Classes Meet
November 21, 2018	W	Friday Classes Meet
November 22 - 25, 2018	R - Su	Thanksgiving Break - University Closed
December 12, 2018	W	Last Day of Classes
December 14, 2018	F	Reading Day
December 15 - 21, 2018	F - R	Final Exam Period

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## Course Outline

### VI. Schedule

Any changes to these lecture sets will be identified on Moodle

#### September 3-September 9

Visual introduction to the course and syllabus (short video)

Lecture 1 Introduction to Energy and Sustainability

Text: Chapter 1 Sustainable Energy: The Engine of Sustainable Development pp.1-30

Discussion #1

#### September 10-September 16

Lecture 2 Energy in the Bio-Environment

Text: pp 333-357

Practice Quiz must be taken

Discussion #2

#### September 17-September 23

Lecture 3 Everyday Energy

Text: pp 14-20

#### September 24-September 30

Lecture 4 Heat Energy Part 1

Part 2 More on Thermodynamics

Text: pp 108-122, 142-150

### October 1-October 7

Lecture 5 Energy Use Part 1

Energy Use Part 2

Text: Chapter 1 pp 26-30

### October 8-October 14

Lecture 6 Fossil Fuels: Coal Part 1

Coal Part 2

Text: pp 70-87

### October 15-October 21

Lecture 7 Natural Gas and related fuel sources

Text: pp 374-384; pp 429-442

### October 22-October 28

**Midterm Week**

**Submit Topics for Research Paper**

### October 29-November 4

Lecture 8 Electrical Power Part 1

Electrical Power Part 2

Text: pp 757-780; pp 827-842

### November 5- November 11

Lecture 9 Solar Energy, Photovoltaics

Text: pp 646-647; pp 677-692

### November 12-November 18

Lecture 10 Wind Energy

Text: pp 722-740

### November 19-November 25

Lecture 11 Nuclear Power Plants, Part 1 and 2

Text: pp 447-477, 482-488, 492-493

Research Paper (see moodle for requirements) due end week

### November 26-December 2

Lecture 12 Energy Storage: Batteries

Text: pp 808-827

### December 3-December 9

Lecture 13...TBD

Exam Review materials

### December 12 last day of classes

**Final Exam period begins December 15. Exam date to be scheduled on Moodle.**

## VII. Resources for NJIT Online Students

### IST Service Desk

The IST Service Desk is the central hub for computing information and first point of contact for getting help and reporting issues related to computing technology at NJIT.

Students can put in a ticket with the service desk: <https://servicedesk.njit.edu/CherwellPortal/IST>

or call (973) 596-2900 Monday - Friday from 8:00am – 9:00pm

### Academic Advising Success Center

“...assist in the advisement of students who are undecided in their major, transitioning into another major at NJIT, and those students who need additional support to graduate successfully and in a timely manner.”

## Academic Integrity

“New Jersey Institute of Technology is an institution dedicated to the pursuit of knowledge through teaching and research. The university expects that its graduates will assume positions of leadership within their professions and communities. Within this context, the university strives to develop and maintain a high level of ethics and honesty among all members of its community. Imperative to this goal is the commitment to truth and academic integrity. This commitment is confirmed in this NJIT University Code on Academic Integrity.”

## Academic Support and Student Affairs

“From questions about becoming a student at NJIT – to student engagement – to searching for information on career development, the Division of Academic Support and Student Affairs Staff is here to help.”

## Additional Tutoring Centers

Math Learning Center; Chemistry Learning Center; The Writing Center; ECE Study Groups

Bookstore “Show your New Jersey Institute Of Technology pride all year long with our authentic assortment of New Jersey Institute Of Technology collegiate apparel...Plus, our selection of textbooks, computers, and supplies will ensure every New Jersey Institute Of Technology student is prepared for success.”

## Center for Counseling and Psychological Services

“The NJIT Center for Counseling and Psychological Services (C-CAPS) is committed to assisting students in the achievement of their academic goals as well as benefiting from their personal experience on campus. College life can be personally challenging and stressful at times. We believe that the educational process is an important component of the development of the individual as a whole person. Our goal is to optimize the college experience and improve the quality of the lives of our students by promoting their mental health and facilitating students’ personal, academic and professional growth.”

## Disability Support Services

“The Disability Support Services office works in partnership with administrators, faculty and staff to provide reasonable accommodations and support services for students with disabilities that have provided our office with documentation to receive services.”

## The Learning Center

“Our mission is to assist students both in the classroom and beyond by providing tutorial services, academic coaching, academic and personal enrichment workshops and staff and peer support so students can meet the demands of their coursework and are prepared for life after graduation.”

## Moodle Help Page

Tutorials for students.

## Robert W. Van Houten Library

“The Van Houten Library offers electronic and print resources essential to the mission of New Jersey's science and technology university, including a core collection of academic books, databases, and journals, as well as research and consultation services.”

Student Financial Aid Services “Student Financial Aid Services (SFAS) at NJIT is committed to providing you with every opportunity to obtain funding to support your undergraduate educational costs at NJIT.”