General Information

Professor Information

**Instructor**: Rodolfo Rego, M.S.

**E-Mail**: rrego@fiu.edu

**Office**: AHC5 384 (MMC)

**Phone**: (305) 348-1478

**Website**: FIU Earth and Environment

**Office Hours**: Wednesday 1:00 PM - 3:00 PM or by Appointment.

**Methods**:
- Zoom
- Office Visit
- Phone call

Course Description and Purpose

The course is designed to acquaint students with the principles of energy flow in the environment and will focus on introduction to the physical science principles and concepts needed to understand energy issues. It will also examine the energy use and efficiency, current energy sources, environment impacts of energy use, climate change and energy, and future renewable energy alternatives.

Course Objectives

After completing this course, students should be able to apply their knowledge of Energy Flow in the Environment to

1. Apply scientific principles and theories to problem solving;
2. Test scientific hypothesis by applying the scientific method;
3. Evaluate scientific statements; and
4. Interpret new information within the context of existing knowledge.
5. Solve word problems related to physics and energy use.
Course Awards

Affordability Counts
This course has been awarded the Affordability Counts Medallion. The Affordability Counts initiative at FIU seeks to make learning more affordable by reducing the cost of course materials to $60 or less. Find out more by visiting the Affordability Counts website at lowcost.fiu.edu.

Important Information

Policies
Please review the FIU’s Policies and Netiquette webpage. The policies webpage contains essential information regarding guidelines relevant to all courses at FIU, as well as additional information about acceptable netiquette for online courses.

As a member of the FIU community you are expected to be knowledgeable about the behavioral expectations set forth in the FIU Student Code of Conduct.

Technical Requirements and Skills

One of the greatest barriers to taking an online course is a lack of basic computer literacy. By computer literacy we mean being able to manage and organize computer files efficiently, and learning to use your computer's operating system and software quickly and easily. Keep in mind that this is not a computer literacy course; but students enrolled in online courses are expected to have moderate proficiency using a computer. Please go to the "What’s Required" webpage to find out more information on this subject.

Privacy Policy Statements for partners and Vendors

- Canvas
- Microsoft
- Adobe
- Google
- ProctorU
- HonorLock (PDF)
- Turnitin
- NBC Learn
- OpenStax
- Adobe Connect
- Respondus LockDown Browser
- Zoom

Please visit our Technical Requirements webpage for additional information.
The Disability Resource Center collaborates with students, faculty, staff, and community members to create diverse learning environments that are usable, equitable, inclusive and sustainable. The DRC provides FIU students with disabilities the necessary support to successfully complete their education and participate in activities available to all students. If you have a diagnosed disability and plan to utilize academic accommodations, please contact the Center at (305) 348-3532 or visit them at the Graham Center GC 190.

For additional assistance please contact FIU's Disability Resource Center.

Web Accessibility Statements for Partners and Vendors

- Canvas
- Microsoft
- Adobe
- Google
- ProctorU
- HonorLock
- OpenStax
- Turnitin
- NBC Learn
- Adobe Connect
- Respondus LockDown Browser
- Zoom

Please visit our ADA Compliance webpage for additional information about accessibility involving the tools used in this course.

**Accessibility and Accommodation**

Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly to demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook.

Academic Misconduct includes: **Cheating** – The unauthorized use of books, notes, aids, electronic sources; or assistance from another person with respect to examinations, course assignments, field service reports, class recitations; or the unauthorized possession of examination papers or course materials, whether originally authorized or not. **Plagiarism** – The use and appropriation of another’s work without any indication of the source and the representation of such work as the student’s own. Any student who fails to give credit for ideas, expressions or materials taken from another source, including internet sources, is responsible for plagiarism.

Learn more about the academic integrity policies and procedures as well as student resources that can help you prepare for a successful semester.
Panthers Care & Counseling and Psychological Services (CAPS)

If you are looking for help for yourself or a fellow classmate, Panthers Care encourages you to express any concerns you may come across as it relates to any personal behavior concerns or worries you have, for the classmate's well-being or yours; you are encouraged to share your concerns with FIU's Panthers Care website.

Counseling and Psychological Services (CAPS) offers free and confidential help for anxiety, depression, stress, and other concerns that life brings. Professional counselors are available for same-day appointments. Don't wait to call (305) 348-2277 to set up a time to talk or visit the online self-help portal.

Course Prerequisites

This course has College Algebra as a prerequisite. Review the Course Catalog, webpage for prerequisites information.

Proctored Exam Policy

This online section does not require an on-campus exam; however, HonorLock is used for the Midterm and Final Exams.

Textbook and Course Materials

Title: Energy Explained - Web Based

Publisher: Energy Information Administration (EIA)

Publish Date: Updated Annually from US E.I.A.

Notes: Provided at no cost to students

All readings are included as web links within each Module.
Expectations of This Course

This is an online course, which means most (if not all) of the course work will be conducted online. Expectations for performance in an online course are the same for a traditional course. In fact, online courses require a degree of self-motivation, self-discipline, and technology skills which can make these courses more demanding for some students.

Students are expected to:

- **Review the how to get started information** located in the course content
- **Introduce yourself to the class during the first week** by posting a self introduction video in the appropriate blog
- **Take the practice quiz** to ensure that your computer is compatible with Canvas
- **Use Khan Academy** resources to evaluate math skills before first problem set
- **Interact** online with instructor/s and peers
- **Review** and follow the course calendar
- **Log in** to the course at least **four (4) times per week**
- **Respond** to discussions within: Initial post **by Friday** and all responses (e.g., peer review) **by Monday**. (See Discussion section below)
- **Respond** to messages within **no more than two (2) days**
- **Submit** assignments by the corresponding deadline

The instructor will:

- **Log in** to the course at least **five (5) times per week**
- **Respond** to Canvas messages and Course Submission Comments **within two (2) days**.
- **Grade** assignments **within ten (10) days** of the assignment deadline.

Course Detail

Course Communication

Communication in this course will take place via the Canvas Inbox.

Check out the [Canvas Conversations Tutorial](#) or [Canvas Guide](#) to learn how to communicate with your instructor and peers using Announcements, Discussions, and the Inbox.

I will respond to all correspondences within **two (2) days**.
Discussions

Discussions and participation are required, just as if you were in a face to face class. Keep in mind that your discussion forum postings will likely be seen by other members of the course. Care should be taken when determining what to post. Online does not mean silent or student guided. The discussion forums are due:

- First Posted by **Friday** of Week
- Second posted at the end of the week assigned (i.e., Monday of week assigned before 12:00am).

The grade will be dependent on thoughtful participation during the discussion forums. Responses such as 'I agree' or 'yea...what he said' will result in zero points of credit. You can earn your grade and exemplary participation will earn higher scores. **Calculations for the discussions must be submitted to the appropriate dropbox to receive full credit.** Keep in mind that your discussion forum postings will likely be seen by other members of the course. Care should be taken when determining what to post. Read the rubric below for more information. All instructions for each discussion is presented within the assignment.

**CRITERIA - EXEMPLARY**

- **Calculations** - Well-developed calculations without errors.
- **Evidence of Critical Thinking** - Clear evidence of critical thinking - applications, analysis, synthesis and evaluation. Postings are characterized by clarity of argument, depth of insight into theoretical issues, originality of treatment, and relevance. Sometimes include unusual insights. Arguments are well supported.
- **Quantity of Postings** - Interact at least 2 times with other students.
- **Timeliness** - Individual message and at least two responses completed before the deadline. Respond to classmates video postings within the timeframes specified above.

Assessments

In order to mitigate any issues with your computer and online assessments, it is very important that you take the "Practice Quiz" from each computer you will be using to take your graded quizzes and exams. It is your responsibility to make sure your computer meets the minimum **hardware requirements**.

All assessments will auto-submit when (1) the timer runs out OR (2) the closing date/time is reached, **whichever happens first**. For example, if a quiz has a closing time of 5:00 pm but the student begins the exam at 4:55 pm, the student will only have 5 minutes to complete the quiz.

Assessments in this course are not compatible with mobile devices and should not be taken through a mobile phone or a tablet. If you need further assistance please contact **FIU Online Support Services**.

The exams for this course will be monitored by an online integrity system (**HonorLock**) to ensure students' compliance with the University's Code of Academic Integrity. To avoid being deemed in violation of the Code, students may not access unsolicited aids during exams, including, but not limited to: test-banks, online search engines, unauthorized web applications, and other means, via their test-taking device or any other electronic device. Students also may not receive nor provide unauthorized assistance to/from other persons, or copy, save, or share unauthorized copies of exams.

For additional resources concerning **HonorLock**, feel free to visit the **HonorLock Proctoring Student Resources Page**.
**Energy Project**

Students complete a project using the Buildings Industry Transportation Electricity Scenarios (BITES) Tool provided by the National Renewable Energy Laboratory (NREL). Instructions and details for this assignment will be provided in the appropriate course module.


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**Zoom Video Conference**

Zoom is a video conference tool that you can use to interact with your professor and fellow students by sharing screens, chatting, broadcasting live video/audio, and taking part in other interactive online activities. We will be utilizing this tool to conduct office hours or practice sessions.

**Zoom Meetings will be available on Wednesdays from 1pm - 3pm**

**Zoom Test Meeting Room**

Use this link to access the Zoom Test Meeting Room. This meeting room is available to test out the software before joining an actual session.

Reference the provided links to access Zoom student tutorials to learn about the tool, how to access your meeting room, and share your screen.

- [Download Zoom](https://zoom.us/download).
- [Login to Zoom through Desktop Application](https://zoom.us/download).
- [Enable and Test Audio & Webcam](https://zoom.us/download).
- [Schedule a meeting](https://zoom.us/download) or [Join a Zoom meeting](https://zoom.us/download).
- [Invite others to join meeting](https://zoom.us/download).
- [Chat (Professors) - Students look at attendees section for instructions](https://zoom.us/download).
- [Share My Screen](https://zoom.us/download).
- [Record a Local Zoom meeting](https://zoom.us/download).
- [Host Control in Meetings](https://zoom.us/download).
- [Getting Started with iOS](https://zoom.us/download).
- [Getting Started with Android](https://zoom.us/download).
Late Assignment Policy

Canvas will **automatically** deduct points from late submissions. All assignments submitted after the assignment due date are subject to the following deductions.

<table>
<thead>
<tr>
<th># of Days Late</th>
<th>Deduction</th>
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<tbody>
<tr>
<td>1</td>
<td>5% per day</td>
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<tr>
<td>&gt; 7</td>
<td>Cannot be submitted</td>
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</table>

Grading

<table>
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<tr>
<th>Course Requirements</th>
<th>Number of Items</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>Introduce Yourself Video Blog</td>
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<tr>
<td>Problem Set Assignments and Feedback Journal</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>Midterm Exam (<strong>HonorLock required</strong>)</td>
<td>1</td>
<td>12%</td>
</tr>
<tr>
<td>Final Exam (<strong>HonorLock required</strong>)</td>
<td>1</td>
<td>15%</td>
</tr>
<tr>
<td>Energy Project</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td>Energy Discussions</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td><em>Extra Credit</em></td>
<td>1</td>
<td><em>up to 5%</em></td>
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<td><strong>Total</strong></td>
<td><strong>12</strong></td>
<td><strong>100%</strong></td>
</tr>
<tr>
<td>Letter</td>
<td>Range (%)</td>
<td>Letter</td>
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<tr>
<td>A</td>
<td>95 or above</td>
<td>B</td>
</tr>
<tr>
<td>A-</td>
<td>90 - 94</td>
<td>B-</td>
</tr>
<tr>
<td>B+</td>
<td>87-89</td>
<td>C+</td>
</tr>
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</table>
### Introduce Yourself
- **Introduce Yourself**
  - **Due** Jan 13 2020 at 11:59 pm | 3 pts

### Energy Discussion
- **Energy Discussion #1**
  - **Due** Jan 20 2020 at 11:59 pm | 10 pts
- **Energy Discussion #2**
  - **Due** Feb 10 2020 at 11:59 pm | 10 pts
- **Energy Discussion #3**
  - **Due** Mar 16 2020 at 11:59 pm | 10 pts
- **Energy Discussion #4**
  - **Due** Apr 06 2020 at 11:59 pm | 10 pts

### Energy Discussion - Dropbox
- **Energy Discussion #1 - Calculations Dropbox**
  - **Due** Jan 17 2020 at 11:59 pm | 10 pts
- **Energy Discussion #2 - Calculations Dropbox**
  - **Due** Feb 07 2020 at 11:59 pm | 10 pts
- **Energy Discussion #3 - Calculations Dropbox**
  - **Due** Mar 13 2020 at 11:59 pm | 10 pts
- **Energy Discussion #4 - Calculations Dropbox**
  - **Due** Apr 03 2020 at 11:59 pm | 10 pts

### Problem Sets
- **Problem Set #1**
  - **Due** Jan 27 2020 at 11:59 pm | 100 pts
- **Problem Set #1 Feedback Journal**
  - **Due** Feb 03 2020 at 11:59 pm | 100 pts
- **Problem Set #2**
  - **Due** Feb 17 2020 at 11:59 pm | 100 pts
<table>
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<tr>
<th>Assignment</th>
<th>Due Date</th>
<th>Points</th>
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<tbody>
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<td>Problem Set #2 Feedback Journal</td>
<td>Feb 24 2020 at 11:59 pm</td>
<td>100 pts</td>
</tr>
<tr>
<td>Problem Set #3</td>
<td>Mar 23 2020 at 11:59 pm</td>
<td>100 pts</td>
</tr>
<tr>
<td>Problem Set #3 Feedback Journal</td>
<td>Mar 30 2020 at 11:59 pm</td>
<td>100 pts</td>
</tr>
<tr>
<td>Problem Set #4</td>
<td>Apr 13 2020 at 11:59 pm</td>
<td>100 pts</td>
</tr>
<tr>
<td>Problem Set #4 Feedback Journal</td>
<td>Apr 20 2020 at 11:59 pm</td>
<td>100 pts</td>
</tr>
<tr>
<td>Quiz #1</td>
<td>Feb 03 2020 at 11:59 pm</td>
<td>100 pts</td>
</tr>
<tr>
<td>Quiz #2</td>
<td>Feb 24 2020 at 11:59 pm</td>
<td>100 pts</td>
</tr>
<tr>
<td>Quiz #3</td>
<td>Mar 30 2020 at 11:59 pm</td>
<td>100 pts</td>
</tr>
<tr>
<td>Quiz #4</td>
<td>Apr 20 2020 at 11:59 pm</td>
<td>100 pts</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>Mar 09 2020 at 11:59 pm</td>
<td>100 pts</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Apr 25 2020 at 11:59 pm</td>
<td>100 pts</td>
</tr>
<tr>
<td>BITES Energy Project - Presentation Dropbox</td>
<td>Apr 13 2020 at 11:59 pm</td>
<td>100 pts</td>
</tr>
</tbody>
</table>
Extra Credit
- extra credit
  - Due: Apr 20, 2020 at 11:59 pm | 5 pts

Midsemester Grade
- Midsemester Grade
  - 100 pts

Course Calendar
Module 0 | Getting Started - Week 1

- Getting Started
- HonorLock
- Websites: How to Avoid Plagiarism
- Video: The Feynman Technique - 3 Steps to Learning Something New
- Video: How to Get the Most Out of Studying Video Series
- Video: 13 Study Tips
- Video: Why Earth Science?

Assignments

- Introduce Yourself
  Jan 13 | 3 pts
- Practice Quiz
  4 pts
- Academic Honesty Policy
  1 pts
# Module 1 Learning Objectives

## Readings

### What is Energy

- Web page: What is Energy (EIA Energy Explained)
- Web page: Forms of Energy (EIA Energy Explained)
- Web page: Sources of Energy (EIA Energy Explained)
- Web page: Laws of Energy (EIA Energy Explained)
- Web page: Energy Units (EIA Energy Explained)
- Web page: State and U.S. Territory Data (EIA Energy Explained)

### Uses of Energy

- Web page: Use of Energy in the United States (EIA Energy Explained)
- Web page: Energy Use in Industry (EIA Energy Explained)
- Web page: Energy for Transportation (EIA Energy Explained)
- Web page: Energy Use in Homes (EIA Energy Explained)
- Web page: Energy Use in Commercial Buildings (EIA Energy Explained)
- Web page: Energy Efficiency and Conservation (EIA Energy Explained)

### Videos

- Energy Flow (Unit 1 - Powerpoint).pdf
Assignments

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Date</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Discussion #1</td>
<td>Jan 20</td>
<td>10 pts</td>
</tr>
<tr>
<td>Energy Discussion #1 - Calculations Dropbox</td>
<td>Jan 17</td>
<td>10 pts</td>
</tr>
<tr>
<td>Problem Set #1</td>
<td>Jan 27</td>
<td>100 pts</td>
</tr>
</tbody>
</table>

Module 2: Energy and the Environment - Week 3

Module 2 Learning Objectives

Readings

Energy and the Environment

<table>
<thead>
<tr>
<th>Readings</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Web page: Energy and the Environment (EIA Energy Explained)</td>
<td></td>
</tr>
<tr>
<td>Web page: Greenhouse Gases (EIA Energy Explained)</td>
<td></td>
</tr>
<tr>
<td>Web page: Greenhouse Gases' Effect on Climate (EIA Energy Explained)</td>
<td></td>
</tr>
<tr>
<td>Web page: Where Greenhouse Gases Come From (EIA Energy Explained)</td>
<td></td>
</tr>
<tr>
<td>Web page: Outlook for Future Emissions (EIA Energy Explained)</td>
<td></td>
</tr>
</tbody>
</table>
Videos

- Video: What is The OECD? (Investor Trading Academy)
- Video: Environmental Impacts: The SWITCH energy primer (Arcos Films)
- Video: Efficiency: The SWITCH energy primer (Arcos Films)
- Video: Energy Savings Project: Insulating Your Hot Water Pipes (U.S. Department of Energy)

Assignments

- Problem Set #1
  Jan 27 | 100 pts
- Problem Set #1 Feedback Journal
  Feb 03 | 100 pts

Module 3: Fossil Fuels - Week 4

Readings


Oil and Petroleum Products

- Web Page: Oil and Petroleum Products Explained (EIA Energy Explained)
- Web Page: Refining Crude Oil (EIA Energy Explained)
- Web Page: Where Our Oil Comes From (EIA Energy Explained)
### Chemical Composition of Petroleum Products

**Gasoline**

- Web Page: Gasoline Explained (EIA Energy Explained)
- Web Page: Where Our Gasoline Comes From (EIA Energy Explained)
- Web Page: Use of Gasoline (EIA Energy Explained)
- Web Page: Gasoline Prices and Outlook (EIA Energy Explained)
- Web Page: Factors Affecting Gasoline Prices (EIA Energy Explained)
- Web Page: Regional Gasoline Price Differences (EIA Energy Explained)
- Web Page: Gasoline Price Fluctuations (EIA Energy Explained)
- Web Page: History of Gasoline (EIA Energy Explained)
- Web Page: Gasoline and the Environment (EIA Energy Explained)

**Diesel Fuel**

- Web Page: Diesel Fuel Explained (EIA Energy Explained)
- Web Page: Where Our Diesel Comes From (EIA Energy Explained)
- Web Page: Use of Diesel (EIA Energy Explained)
### Web Page: Diesel Prices and Outlook (EIA Energy Explained)

### Web Page: Factors Affecting Diesel Prices (EIA Energy Explained)

### Web Page: Diesel Fuel Surcharges (EIA Energy Explained)

### Web Page: Diesel and the Environment (EIA Energy Explained)

### Sources of Petroleum Product Contamination and Their Impacts on the Environment

### Web page: IEA Atlas of Energy (IEA)

### Podcasts

- **Podcast: Press Conference: USGS World Estimate for Conventional Oil and Gas Resources** *(USGS)*

### Videos

- **Video: Foundation of Modern Life: The SWITCH energy primer** *(Arcos Films)*

- **Video: Oil: The SWITCH energy primer** *(Arcos Films)*

- **Video: How Oil is Made** *(Arcos Films)*

- **Video: Fractional Distillation | The Chemistry Journey | The Fuse School** *(FuseSchool - Global Education)*

- **Video: Drilling for Oil** *(Arcos Films)*

- **Video: Crude Oil Fractions and their uses | The Chemistry Journey | The Fuse School** *(FuseSchool - Global Education)*

- **Video: The true cost of oil | Garth Lenz | TEDxVictoria** *(TedEx Talks)*

### Assignments

- **Quiz #1**
  - Feb 03 | 100 pts

- **Problem Set #1 Feedback Journal**
  - Feb 03 | 100 pts
# Reading

## Heating Oil

- [Web Page: Heating Oil Explained](EIA Energy Explained)

- [Web Page: Where Heating Oil Comes From](EIA Energy Explained)

- [Web Page: Uses of Heating Oil](EIA Energy Explained)

- [Web Page: Heating Oil Prices and Outlook](EIA Energy Explained)

- [Web Page: Factors Affecting Heating Oil Prices](EIA Energy Explained)

- [Webpage: Oil vs. Natural Gas for Home Heating: Which Costs More?](Scientific American)

- [Webpage: Northeast Home Heating Oil Reserve](Energy.gov)

- [A RENAISSANCE IN US PRODUCTION LIGHT TIGHT OIL](EIA Energy Explained)

## Videos

- [Video: Natural Gas from Shale](Chevron)

- [Video: Unconventional Sources of Oil](Arcos Films)

- [Video: Using Hydraulic Fracturing and Horizontal Drilling for Natural Gas Production](Chevron)

## Assignments

- [Energy Discussion #2](Feb 10 | 10 pts)

- [Energy Discussion #2 - Calculations Dropbox](Feb 07 | 10 pts)

- [Problem Set #2](Feb 17 | 100 pts)
Learning Objectives-Hydrocarbon Gas Liquids, Natural Gas, & Coal

Readings

**Hydrocarbon Gas Liquids**

- Web Page: Hydrocarbon Gas Liquids Explained (EIA Energy Explained)
- Web Page: Where do Hydrocarbon Gas Liquids Come From (EIA Energy Explained)
- Web Page: Transporting and Storing Hydrocarbon Gas Liquids (EIA Energy Explained)
- Web Page: Uses of Hydrocarbon Gas Liquids (EIA Energy Explained)
- Web Page: Imports and Exports of Hydrocarbon Gas Liquids (EIA Energy Explained)
- Web Page: Prices for Hydrocarbon Gas Liquids (EIA Energy Explained)

**Natural Gas**

- Web Page: Natural Gas Explained (EIA Energy Explained)
- Web Page: Delivery and Storage of Natural Gas (EIA Energy Explained)
- Web Page: Natural Gas Pipelines (EIA Energy Explained)
- Web Page: Liquefied Natural Gas (EIA Energy Explained)
- Web Page: Where Our Natural Gas Comes From (EIA Energy Explained)
- Web Page: Natural Gas Imports and Exports (EIA Energy Explained)
- Web Page: Use of Natural Gas (EIA Energy Explained)
- Web Page: Natural Gas Prices (EIA Energy Explained)
- Web Page: Factors Affecting Natural Gas Prices (EIA Energy Explained)
Coal

- [Web Page: Coal Explained (EIA Energy Explained)](#)
- [Web Page: Coal Mining and Transportation (EIA Energy Explained)](#)
- [Web Page: Where Our Coal Comes From (EIA Energy Explained)](#)
- [Web Page: Coal Imports and Exports (EIA Energy Explained)](#)
- [Web Page: How Much Coal Is Left (EIA Energy Explained)](#)
- [Web Page: Use of Coal (EIA Energy Explained)](#)
- [Web Page: Coal Prices and Outlook (EIA Energy Explained)](#)
- [Web Page: Coal and the Environment (EIA Energy Explained)](#)
- [Web page: Fossil Energy Sources (Department of Energy)](#)
- [Web page: National Coal, Oil and Gas Assessment (USGS)](#)

Videos

- [Video: Coal 101 (Arcos Films)](#)
- [Video: Natural Gas (Arcos Films)](#)
- [Video: What's the Big Idea? — Creating Cleaner Energy from Coal (USGS)](#)

Assignments

- [Problem Set #2](#)
  - Feb 17 | 100 pts
- [Problem Set #2 Feedback Journal](#)
  - Feb 24 | 100 pts
Practice Midterm | Week 8

- Midterm Exam Examples
- PRACTICE Midterm Exam
  51 pts

BITES Energy Project - Week 8

- BITES Energy Project - Goals
- BITES Energy Project - Introduction
- BITES Energy Project - Getting Started
- BITES Energy Project - Assignment
- BITES Energy Project - Presentation Dropbox
  Apr 13 | 100 pts

Midterm Exam Week 9

- Midterm Exam
  Mar 09 | 100 pts

Module 4: Alternative to Fossil Fuels - Week 10

- Learning Objectives- Nuclear & Heat Engines

Readings


Nuclear

- Web Page: Nuclear Explained (EIA Energy Explained)
- Web Page: Nuclear Power Plants (EIA Energy Explained)
Heat Engines

Heat Engines.pdf

Web page: How do Heat Engines Work? (ExplainThatStuff!) - Press on link to open

Web page: Heat Engines and Work Practice (Khan Academy) - Press on link to open

Web page: Heat Engine (Energy Education)

Videos

Video: Nuclear (Arcos Films)

Video: How Nuclear Works (Arcos Films)

Video: Nuclear Risks, Potential Solutions (Arcos Films)

Video: How bad is it really? Nuclear technology -- facts and feelings: Sunniva Rose at TEDxOslo 2013

Video: Heat Engines And Second Law Of Thermodynamics (TutorVista)
Assignments

**Energy Discussion #3**  
Mar 16 | 10 pts

**Energy Discussion #3 - Calculations Dropbox**  
Mar 13 | 10 pts

**Problem Set #3**  
Mar 23 | 100 pts

**Module 4: Alternative to Fossil Fuels - Week 11**

**Learning Objectives-Hydropower**

**Readings**

- [Web Page: Hydropower Explained](EIA Energy Explained)
- [Web Page: Where Hydropower Is Generated](EIA Energy Explained)
- [Web Page: Hydropower and the Environment](EIA Energy Explained)
- [Web Page: Tidal Power](EIA Energy Explained)
- [Web Page: Wave Power](EIA Energy Explained)
- [Web Page: Ocean Thermal Energy Conversion](EIA Energy Explained)
- [Hydropower Presentation]
- [Web page: Types of Hydropower Plants](U.S. Department of Energy)
- [Web page: Types of Hydropower Turbines](U.S. Department of Energy)
- [Web page: Glossary of Hydropower Terms](Energy.gov)
### Videos

- [Video: Energy 101: Hydropower](U.S. Department of Energy)
- [Video: Renewable Energy: Hydropower](Reclamation)
- [Video: How does GE's Hydro Variable Speed Pumped Storage technology work?](GE Renewable Energy)
- [Video: Hydro power - Converting tidal power into electricity](Siemens)

### Assignments

- **Problem Set #3**
  Mar 23 | 100 pts
- **Problem Set #3 Feedback Journal**
  Mar 30 | 100 pts

### Module 4: Alternative to Fossil Fuels - Week 12

#### Learning Objectives-Biomass and Biofuels

#### Readings

##### Biomass

- **Biomass Presentation**
- [Web page: Biomass Explained](EIA Energy Explained)
- [Web page: Wood and Wood Waste](EIA Energy Explained)
- [Web page: Landfill Gas and Biogas](EIA Energy Explained)
Biofuels: Ethanol & Biodiesel

- Web page: Biofuels: Ethanol & Biodiesel Explained (EIA Energy Explained)
- Web page: Ethanol Explained (EIA Energy Explained)
- Web page: Use of Ethanol (EIA Energy Explained)
- Web page: Ethanol and the Environment (EIA Energy Explained)
- Web page: Biodiesel Explained (EIA Energy Explained)
- Web page: Use of Biodiesel (EIA Energy Explained)
- Web page: Biodiesel and the Environment (EIA Energy Explained)

Videos

- Video: Energy 101 | Biofuels (U.S. Department of Energy)
- Video: NREL National Bioenergy Center Overview (National Renewable Energy Laboratory - NREL)
- Video: NREL Research on Converting Biomass to Liquid Fuels (National Renewable Energy Laboratory - NREL)
- Web page: The Biofuel Atlas (Renewable Energy Laboratory - NREL)
- Web page: Biopower Atlas (Renewable Energy Laboratory - NREL)
- Video: How It's Made - BIODIESEL (How it's Made)

Assignments

- Quiz #3
  Mar 30 | 100 pts
Module 4: Alternative to Fossil Fuels - Week 13

Learning Objectives-Wind, Geothermal and Solar

Readings

Wind

- [Wind Energy Presentation](#)
- Web page: Wind Explained (EIA Energy Explained)
- Web page: Electricity Generation from Wind (EIA Energy Explained)
- Web page: Where Wind Power Is Harnessed (EIA Energy Explained)
- Web page: Types of Wind Turbines (EIA Energy Explained)
- Web page: History of Wind Power (EIA Energy Explained)
- Web page: Wind Energy and the Environment (EIA Energy Explained)
- Wind Energy Benefits (U.S. Department of Energy)
- Web page: Unlocking Our Nation's Wind Potential (U.S. Department of Energy)
- Wind Turbine (Calculations) - Use for Problem Set #4

Geothermal

- [Geothermal Presentation](#)
- Web page: Geothermal Explained (EIA Energy Explained)
- Web page: Use of Geothermal Energy (EIA Energy Explained)
Solar

Solar Presentation

Web page: Solar Explained (EIA Energy Explained)

Web page: Photovoltaics and Electricity (EIA Energy Explained)

Web page: Where Solar Is Found (EIA Energy Explained)

Web page: Solar Thermal Power Plants (EIA Energy Explained)

Web page: Solar Thermal Collectors (EIA Energy Explained)

Web page: Solar Energy and the Environment (EIA Energy Explained)

Web page: Solar Photovoltaic Technology Basics (NREL)


Web page: Active Solar Heating (Energy.gov)

Web page: Concentrating Solar Power Basics (NREL)

Web page: FIU and FPL unveil one-of-a-kind solar research facility (FIU News)

Videos

Video: How do Wind Turbines Work (Learn Engineering)
Assignments

- Energy Discussion #4
  Apr 06 | 10 pts
- Energy Discussion #4 - Calculations Dropbox
  Apr 03 | 10 pts
- Problem Set #4
  Apr 13 | 100 pts

Module 5: Heating and Cooling Buildings - Week 14

Readings

- Web Page: Basics of Building Heating and Cooling (ArchToolbox)
- Web page: What is thermal conductivity? (Khan Academy)
- Web page: Degree-Days Explained (EIA Energy Explained)
- Web page: Insulation (Energy.gov)

Videos

- Video: Thermal conduction, convection, and radiation | Thermodynamics | Physics (Khan Academy)
Assignment

- **Problem Set #4**
  - Apr 13 | 100 pts

- **Problem Set #4 Feedback Journal**
  - Apr 20 | 100 pts

- **BITES Energy Project - Presentation Dropbox**
  - Apr 13 | 100 pts

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**Module 6: Secondary Sources - Week 15**

- Learning Objectives-Electricity and Hydrogen

**Readings**

- **Web page: Secondary Energy Sources Explained (EIA Energy Explained)**

**Electricity**

- **Electricity Presentation**

- **Web page: Electricity Explained (EIA Energy Explained)**

- **Web page: The Science of Electricity (EIA Energy Explained)**

- **Web page: Magnets and Electricity (EIA Energy Explained)**

- **Web page: Batteries, Circuits, and Transformers (EIA Energy Explained)**

- **Web page: Measuring Electricity (EIA Energy Explained)**

- **Web page: How Electricity Is Generated (EIA Energy Explained)**

- **Web page: Electricity in the United States (EIA Energy Explained)**
### Video: Hydrogen Fuel Cells (How it's Made)

### Assignments

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<tr>
<th>Assignment</th>
<th>Due Date</th>
<th>Points</th>
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<td>Quiz #4</td>
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### Week 16 - Final Exam

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<td>Potential Energy - Reservoir</td>
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<td>PRACTICE Final Exam</td>
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### Weekly Schedule

**Weekly Schedule**

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<tr>
<td>Mar. 1 - 7</td>
<td>Supports Learning Objectives:</td>
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<td>Mar. 8 - 14</td>
<td>Supports Learning Objectives:</td>
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<tr>
<td>Mar. 15 - 21</td>
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<tr>
<td>Mar. 22 - 29</td>
<td>Supports Learning Objectives:</td>
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