Course Number and Section: ENTC4335.00

Name of Instructor: dr. Adrian Georgescu

Class meeting time and location:
MTWR 02:00-03:55 PM at OCNR-255
Summer I 2014

Office: ST207D
Office Hours: TBD
E-Mail: adrian.georgescu@tamucc.edu

Office Telephone: 361-825-2813

ENTC4335 Energy Conversion

Course Description
This course introduces Energy Conversion principals and discusses conventional energy conversion technologies (steam power plants, internal combustion engines, gas turbines, hydraulic turbines), advanced technologies (nuclear power, advanced coal power plants, stirling engines), as well as renewable energy technologies (solar technologies including thermal, concentrated and photovoltaics, wind power, geothermal, biomass and biofuels etc.).

Learning Objectives
This course is designed to enable students to:
- Understand the functioning of most energy conversion systems;
- Understand the issues involved in conversion, storage and transportation of energy;
- Design and calculation of energy systems;
- Synthesis of components into an energy system

Major Course Requirements
Attend all classes and labs. Regular completion of all reading, homework, and a laboratory design project which extends along the semester is essential. With the initial data different from student to student, each student must design an entire power system, for a particular loading, select the system configuration, composition, define the component rated data and parameters, voltage control equipment and short-circuit solution

Grading Policy
Your course grade will be determined by your performance in the homework assignments, presentation and final project. The distribution of points is as follows:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Schedule (TBA)</th>
<th>Weights</th>
<th>Grading Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td></td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Attendance</td>
<td></td>
<td>10%</td>
<td>90 – 100</td>
</tr>
<tr>
<td>Final project (presentation)</td>
<td></td>
<td>25%</td>
<td>80 - 90</td>
</tr>
<tr>
<td>Final Project (written)</td>
<td></td>
<td>25%</td>
<td>70 - 80</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100%</td>
<td>60 - 70</td>
</tr>
</tbody>
</table>

Required or Recommended Readings
Textbook:
**Recommended:** Energy Conversion, Edited by D. Yogi Goswami and Frank Kreith, Taylor and Francis Group, 2007 (Highly Recommended).

**Supplemental Reading:** Energy Conversion – the ebook, Kenneth C. Weston (Supplemental).

## Course Policies

**Attendance/tardiness:** You are advised to attend all lectures and labs. If you miss a class period, you are responsible for learning the subject matter and announcements covered during your absence.

**Late work and Make-up Exams:** Late assignments will not be accepted. The student will receive a zero on assignments that is turned in after the due date, unless permission is secured from the instructor prior to the due date. Assignments may be turned in before the due date (may be left in my drop box outside my office door). Note that hardware or software failure or machine unavailability does not merit an extension on the assignment.

**Extra Credit:** Exams and Quizzes will occasionally include bonus questions.

**Cell Phone/Electronic Device Usage:** Cell phones, pagers and other texting devices should not be used in class.

**Academic Integrity/Plagiarism:** University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in Disciplinary Probation, Suspension or Expulsion from the University.

**Dropping a Class:** I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class.

**Classroom/professional behavior:** Eating or drinking is NOT permitted in the labs. Students with food or drink will be asked to discard them, or leave the room. Students must obey all safety procedures and use personal protective equipment as required in each laboratory. A student who attempts to use equipment without authorization or violates any safety policy or regulation will be removed from the laboratory.

**Email Communications:** Email is an official means of communication for this class. Check your email daily for announcements and attachments relating to this class.
**Grade Appeals:** As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamu.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage (http://sci.tamu.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

**Disabilities Accommodations:** The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Driftwood 101.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

**Statement of Academic Continuity:** In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

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### Syllabus

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Readings</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>06/02</td>
<td>-</td>
<td>What is energy? Definition, types, conversion, units</td>
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<tr>
<td>1</td>
<td>06/03</td>
<td>Ch.1(1), Ch.1(2)</td>
<td>Energy needs and energy resources – an overview</td>
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<tr>
<td>1</td>
<td>06/04</td>
<td>Ch.2(1), Ch.5(2), Ch.3(3)</td>
<td>Fossil fuels energy resources and conversion</td>
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<tr>
<td>1</td>
<td>06/05</td>
<td>Ch.8(1), Ch.9(1)</td>
<td>Steam power plants and gas turbines (1)</td>
</tr>
<tr>
<td>2</td>
<td>06/09</td>
<td>Ch.8(1), Ch.9(1)</td>
<td>Steam power plants and gas turbines (2)</td>
</tr>
<tr>
<td>2</td>
<td>06/10</td>
<td>Ch.4(1), Ch.16(1), Ch.8(2),</td>
<td>Nuclear energy resources and conversion</td>
</tr>
</tbody>
</table>
Ch.10(3)  
2  06/11  Ch.5(1), Ch.18(1), Ch.19(1), Ch.9(2), Ch.11(2)  Renewable resources: Solar energy, thermal

2  06/12  Ch.20(1), Ch.10(2)  Renewable resources: Solar energy, photovoltaic

3  06/16  Ch.6(1), Ch.21(1), Ch.12(2)  Renewable resources: Wind energy

3  06/17  Class Notes  Renewable resources: Hydroelectric energy

3  06/18  Ch.23(1), Ch.25(1)  Renewable resources: Marine and geothermal

3  06/19  Ch.22(1),  Renewable resources: Biomass and biofuels

4  06/23  Ch.27(1)  Direct energy conversion

4  06/24  Ch.26(1)  Fuel cells

4  06/25  Ch.15(1)  Energy storage technologies

4  06/26  Ch.13(2)  Transportation energy technologies

5  06/30  Ch.3(2)  Energy management and conservation

5  07/01  Ch.4(2), Ch.8(2)  Environmental Aspects of Power Generation

5  07/02  Class Notes  Electrical machines used in electric power generation

5  07/03  Final project presentations

1. Energy Conversion, Edited by D. Yogi Goswami and Frank Kreith, Taylor and Francis Group, 2007
3. Energy Conversion – the e-book, Kenneth C. Weston

Exams
There will be no midterm or final exams.

Engineering Library Resources
The Mary and Jeff Bell Library houses substantial engineering reference materials available for research and coursework support. Designated coursework will require access and use of these resources as a portion of the grade for assigned work.

Instructional Methods and Activities
Methods and activities for instruction include: lectures, group discussions, homework assignments/solutions, lab experiments/exercises, and software simulation. Students will be expected to read the text before coming to the class. Key aspects of the text material will be discussed in the class.

Pre-requisite
ENTC 3320 (Thermodynamics), ENTC2418 (Introduction to Electronics) or ENTC3415 (Circuit Analysis II).

Note: This syllabus represents an outline for the course. Changes may be necessary and will be announced in class.