The University of Texas at TYLER
COLLEGE OF ENGINEERING

Department of Mechanical Engineering
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MENG 4345/5345 – Energy Conversion Systems
Course Syllabus

Semester / Year	Fall 2019
Catalog Description	This course introduces students to the different energy conversion systems as an integrated form of application of different knowledge bases such as: thermodynamics, chemistry, heat transfer and fluid mechanics. Analysis and design of systems for energy conversion and storage will be carried out with emphasis on efficiency, performance and environmental impact. Graduate students are expected to carry out a major project as an assignment within this course.
Prerequisites	**MENG 3316 Heat Transfer**
Section number	031 & 040
Instructor name	Dr. M. A. R. Biswas
Contact info	Office: HEC A214 E-mail: mbiswas@uttyler.edu Phone: (903) 566-6115
Class Type / Location	Face-to-face & Zoom – Main Campus RBN 2007 / HEC Room B210
Class Time	W: 5:00PM - 7:45 PM
Office Hours	TTh 10:30 to 11:00 am, W 2:30 to 3:45 pm & Th 2:30 to 3:45 pm or By appointment
Credit Hours	3 (3 hours lecture and 0 hours laboratory per week).
Required Textbook	Demirel, Yaşar. Energy : Production, Conversion, Storage, Conservation, and Coupling, Praxis, 2012. (ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/uttyler/detail.action?docID=883989.)
Optional References	Energy Systems Engineering, F.M. Vanek, .and L.D Albright, First Edition, McGraw-Hill, Inc., 2008, ISBN: 978-0-07-149593-6 Design of Fluid Thermal Systems, 4th ed. (SI edition), by W.S. Janna, Cengage Learning, 2010
Additional requirements	MATLAB, Simulink & Simscape by MathWorks, Inc. (available through virtual desktop – one.uttyler.edu)
Evaluation Method	Grading (UG): HW Assignments 40% Quizzes 40% Project (Energy & Cost Analysis of 1 system) 20% Grading (Graduate): HW Assignments/Project Progress Report 40% Quizzes 40%

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	Project (Energy & Cost Analysis + Modeling/Simulation of 2 different systems) 20%
Grading Policy / Scale	Letter grades Scale: A 90 – 100 B 80 – 89 C 70 – 79 D 60 – 69 F < 60
Important events / dates	Census date – September 9 Prelim report date – November 6 Final Report date – December 11
Attendance / Makeup policy	Attendance is expected per university policy. Any violation of the Student Behavior (see below) will result in 1% grade reduction for each incident. Students may appeal the grade reduction to the instructor if valid excuse or reason can be given. Make-up exams or assignments if approved will be administered during finals week.
Course Learning Objectives / ABET & PEOs relation	**Course Learning Objectives** By the end of this course students will be able to: 1. Demonstrate knowledge of the different energy conversion systems and their typical applications. 2. Analyze, perform and conduct preliminary design of various energy conversion systems. 3. Explain the physics of the environmental issues, including the greenhouse effect and global climate change 4. Conduct energy and cost analysis of various energy conversion systems, as well as compare social acceptability and environmental consequences of such systems 5. Apply engineering design and analysis techniques to emerging energy conversion technologies 6. Only for Graduate Students: Conduct the design of a complete integrated conversion system with simulation and produce a draft of a publishable level report.
Tentative Topics	• Fossil fuel power systems including Engines and Gas Turbines • Renewable energy systems including solar energy, wind energy, geothermal energy and biomass energy • Alternative energy technologies including Fuel cell and thermoelectric systems • Discussion of CO2 management
Other	Note: Use the above email only or Canvas messaging, which is used as official mode of campus communication. If you call, please leave a voicemail with name and contact if call is not answered. Please allow instructor at least 24-48 hours to respond to your email/phone.

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NOTE: The syllabus is subject to change during the course of semester as deemed necessary.
Evaluation activities

- Group Project and Reports: engineering teams of upto 6 individuals will work on one design project of a topic approved by the instructor. Each team must propose a project, and analyze a solution to then submit preliminary and final reports by the end of the semester. Moreover, oral/progress/literature review reports will be assigned from lectures to keep track of progress in the topic and project. The average prelim and final report grade multiplied by the Peer and Instructor Evaluation factor along with the average of the other reports give the overall project grade.
- Individual Assignments and Class Conduct: Attendance to lecture is strongly recommended. Bringing textbook, taking notes and participating in discussions are required while in class. Please also participate on several discussion board notes on Canvas for completion grade. Moreover, 2-4 Canvas announced quizzes (no late submissions accepted) will be given according to the topics covered in lectures. Questions involving knowledge covered in class will be answered if the student has attempted the question unsuccessfully. Solutions will not be given. However, students can check their work with the instructor. No late submission for quizzes will be accepted and will result in automatic grade of zero. Note: Graduate students can expect additional assignments relevant to the project for graded submissions.

Note: Instructions on the written and oral report format/style, grading rubric and peer evaluation form will be given separately on Canvas. Late submissions of assignments will result in 10% deduction from the graded score within 24 hours and 50% deduction of the graded score after 24 hours until late last day of class. All late assignments along with any optional bonus activities must be submitted on Canvas by last day of class (Wednesday, Dec 4 at 5 pm).

Grade appeal: grades can be appealed by meeting the instructor during office hours, but no later than a week after the grade has been given.

Note: your final semester grade is based on the 10-point scale. No curving or scaling will be applied even if you receive borderline grade such as 79.99.

University Policies:

UT Tyler Honor Code
Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Students Rights and Responsibilities

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To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: http://www.uttyler.edu/wellness/rightsresponsibilities.php

Campus Carry
We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at http://www.uttyler.edu/about/campus-carry/index.php

UT Tyler a Tobacco-Free University
All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors.
Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless
tobacco, snuff, chewing tobacco, and all other tobacco products.
There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support.
For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

Grade Replacement/Forgiveness and Census Date Policies
Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at http://www.uttyler.edu/registrar. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.
Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.
The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms , requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes , adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

State-Mandated Course Drop Policy
Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).

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Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

Disability/Accessibility Services
In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit https://hood.accessiblelearning.com/UTTyler and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at http://www.uttyler.edu/disabilityservices, the SAR office located in the University Center, # 3150 or call 903.566.7079.

Student Absence due to Religious Observance
Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities
If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement
It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Emergency Exits and Evacuation
Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

Student Standards of Academic Conduct
Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

i. "Cheating" includes, but is not limited to:
   - copying from another student's test paper;
   - using, during a test, materials not authorized by the person giving the test;

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- failure to comply with instructions given by the person administering the test;
- possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
- collaborating with or seeking aid from another student during a test or other assignment without authority;
- discussing the contents of an examination with another student who will take the examination;
- divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
- substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
- paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
- falsifying research data, laboratory reports, and/or other academic work offered for credit;
- taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
- misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

ii. "Plagiarism" includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the submission of it as one's own academic work offered for credit.

iii. "Collusion" includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

iv. All written work that is submitted will be subject to review by plagiarism software.

UT Tyler Resources for Students

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254)

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Date		Lecture
Aug	28	Syllabus/Chapter 1
Sep	4	Chapter 2 Lecture; **Review Quiz: Covers topics from Chapter 1 along with Thermodynamics, Fluid Mechanics and Heat Transfer**
	11	**Project Groups due on Canvas**/ Chapter 2 Lecture
	18	Chapter 3 Lecture
	25	Chapter 3 Lecture / Chapter 4 Lecture
Oct	2	Chapter 4 Lecture/Work on Project
	9	Chapter 5 Lecture
	16	Chapter 5 Lecture/ Chapter 6 Lecture
	23	Chapter 7 Lecture/Work on Project
	30	Chapter 7 Lecture/Work on Project
Nov	6	Chapter 7 Lecture/ **Prelim Project Report due**
	13	Chapter 7 Lecture
	20	Chapter 8 Lecture
	27	Thanksgiving Week - No Classes
Dec	4	Chapter 9 Lecture /Work on Project/ LAST DAY for All late assignments by 5 pm
	11	**Final Project Report and Peer Evaluation Due** (No Class)

Prepared By: M. A. R. Biswas Date: 8/29/2019