

**Department of Civil Environmental and Geomatics Engineering
Florida Atlantic University
Course Syllabus**

1. Course title/number, number of credit hours	
Fundamentals of Energy Engineering – EGN 4732	3 credit hours
2. Course prerequisites, corequisites, and where the course fits in the program of study	
Prerequisites: PHY 2048 General Physics 1 or General Physics for Engineers 1 or equivalent with minimum grade of “C”	
3. Course logistics	
Term: Fall 2019 This is a classroom lecture course. The class meets for two 80-minute sessions per week. Assignments include a team project/lab and in-class presentation. Room: TBD; Time: TBD;	
4. Instructor contact information	
Instructor's name	Dr. James H. VanZwieten
Office address	Engineering East (EE-96), Room 316
Office Hours	TBD;
Contact telephone number	561-297-0955
Email address	jvanzwi@fau.edu
5. TA contact information	
TA's name	TBD
Office address	TBD
Office Hours	TBD
Email address	TBD
6. Course description	
This course provides an overview of renewable energy technology and outlines the basic principles of solar electricity, solar water heating, wind power, marine renewable energy, micro-hydro, biomass and heat pumps and their application in urban and rural environments. In addition, the fundamentals of conventional power generation (fossil fuel, nuclear, etc.) are discussed.	
7. Course objectives/student learning outcomes/program outcomes	
Course objectives	1) Present basics of renewable energy 2) Present concepts of energy production and use 3) Present advantages and limitations of energy options
Student learning outcomes & relationship to ABET 1-7 objectives	A. Ability to calculate the environmental loads on renewable energy systems and estimate power production for these systems (1) B. Ability to analyze energy needs and formulate appropriate energy production solution (2) C. Ability to conduct a small energy related projects/experiment in teams and present associated findings to the class (3,5,6)
8. Course evaluation method	
Attendance	5%, Each class missed in excess of 3 classes will result in a 20% reduction in your attendance grade.
Quizzes	20%, held on the last class day of each week (excluding test weeks)
Test1	15%, held on the last class day of the fifth week of class
Test2	15%, held on the last class day of the tenth week of class
Project, Report, Presentation	15%, Project held on eleventh week of class with report and presentation due on the thirteenth week of class
Final Examination	30%, TBD
9. Course grading scale	
Course Letter Grade: The following grading scale will be adopted for this class, and students are explicitly warned that there is no curving of grades. They are expected to monitor their class performances and determine whether the results meet their expectations.	

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≥ 90	A
86 – 89.9	A–
82 – 85.9	B+
78 – 81.9	B
74 – 77.9	B–
70 – 73.9	C+
65 – 69.9	C
60 – 64.9	C–
55 – 59.9	D+
50 – 54.9	D
45 – 49.9	D–
< 45	F
10. Policy on makeup tests, late work, and incompletes	
<i>Makeup test</i> are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student from taking the test. <i>Incomplete grades</i> are against the policy of the department. Unless there is solid evidence of medical or otherwise serious emergency situation incomplete grades will not be given.	
11. Special course requirements	
Students must perform a laboratory experiment during the semester; it will be a team effort.	
12. Classroom etiquette policy	
University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones and laptops, are to be disabled in class sessions.	
13. Attendance policy statement	
Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.	
14. Disability policy statement	
In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/ .	
15. Counseling and Psychological Services (CAPS) Center	
Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider	

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utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>.

16. Code of Academic Integrity policy statement

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001.

www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf

17. Required texts/reading

Aldo Viera da Rosa. *Fundamentals of Renewable Energy Processes*, 3rd edition, 2013, Elsevier, ISBN 0123972191

18. Course topical outline, including dates for exams/quizzes, papers, completion of reading

DATE	TOPIC
Week 1	Introduction, Generalities, Conventional Energy Sources and Conventional Power Generation (coal, gas, oil, nuclear, hydropower)
Week 2	Conventional Energy Sources and Conventional Power Generation (coal, gas, oil, nuclear, hydropower)
Week 3	Essentials of interconnected power systems and comprehensive overview of the terminology, electrical and thermodynamic concepts, design considerations, construction practices, operations aspects, and industrial standards
Week 4	Thermodynamics and Heat Engines
Week 5	Thermodynamics and Heat Engines, Exam 1
Week 6	Thermionics
Week 7	Fuel Cells
Week 8	Fuel Cells
Week 9	Solar Energy
Week 10	Solar Energy, Exam 2
Week 11	Biomass, Lab Experiment
Week 12	Wind Energy
Week 13	Wind Energy, Lab Reports Due and Presentations
Week 14	Marine Renewable Energy (Tidal Energy, Ocean Current Energy)
Week 15	Marine Renewable Energy (Wave Energy Conversion, Ocean Thermal Energy Conversion, Sea Water Based Cooling)
Final Exam	Final Exam