



Course Description: This course provides a comprehensive introduction to the principles and practical applications of solar, wind, geothermal, hydroelectric, ocean and biomass renewable energy technologies. Motivations for developing renewable energy will be examined and students will evaluate their personal energy footprint and create a plan to reduce it. Demonstrations, field trips and labs will provide direct contact with the technology. Students will work in teams on a design project to explore one technology in depth.

Outcomes & Objectives

1. Identify key components and principles of renewable energy technologies
 - a. Identify key components and principles of a solar photovoltaic system
 - b. Identify key components and principles of a solar thermal system
 - c. Identify key components and principles of a wind turbine system
2. Identify key reasons why renewable energy technology has the potential to help solve environmental and economic problems in Michigan and around the world.
 - a. Identify environmental and economic problems caused by non-renewable energy technologies
 - b. List the pros and cons of renewable energy technologies
3. Analyze personal energy consumption and identify ways to move to a 'greener' personal energy footprint.
 - a. Analyze personal or family energy footprint using a carbon footprint calculator
 - b. Identify ways to personally conserve energy or replace energy sources with "greener" sources
4. Design a renewable energy system for a home or small business.
 - a. Evaluate a home or small business site for suitability of solar photovoltaic, solar thermal, passive solar, wind turbine or micro-hydro energy
 - b. Develop specifications and identify components and costs for a renewable energy system for a home or small business

Instructor: Dale Petty

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Email: petty@wccnet.edu

Websites: <https://blackboard.wccnet.edu/> <http://courses.wccnet.edu/~petty/>

Office: TI 122C

Office Hours: Schedule posted in TI 122 and at <http://www4.wccnet.edu/search/officehours/pdf/officehours.pdf>
Please make an appointment for other times.

Prerequisites: Reading and Writing Level 6, Math Level 3

Communications: Regularly check your wccnet.edu email for notices and assignments. If you don't regularly check this account, set up forwarding to an account that you do use. Many materials will be available to you only on Blackboard. Make sure that you have a reliable way to access them through your home or other computer.

- Materials:** Required:
Home Power Magazine – online version <http://homepower.com/home/>
Calculator (preferably scientific)
Access to a computer that can access the internet and the college’s Blackboard site.
- Supplied by Instructor:
Web links, articles, books to loan, lab equipment, equipment manuals, tools
- Format:** Classes will include lecture, discussion, teamwork, field trips, and hands-on activities.
- Homework:** You should expect to spend at least 6 hours per week outside of class reading, working problems, working on your project, discussing with classmates, studying for quizzes and exams and taking online quizzes and exams. Please do reading assignments and exercises prior to the next class so that you arrive prepared to share questions and insights. (see [How Much Time Should You Devote to Studying?](#))
- Quizzes:** There will be regular quizzes throughout the semester, usually done online in Blackboard. You may use a calculator and any printed or online resources, but you must do your own work unless otherwise noted. You are responsible for making sure you have a reliable way to access Blackboard.
- In-class Exercises:** Follow appropriate electrical and mechanical safety practices at all times!
- Hands-on activities will be done in teams. Please work cooperatively with your teammates so that everyone gets an equal chance to learn. Regularly check in with each other and ask how you can help, and share what is helpful to you.
- Book/Video/Lecture Report or Presentation:** Write a report or do a presentation on a book, video, or live lecture connected with renewable energy. See *Instructions for Report on Renewable Energy Book_Video_Lecture.doc* for details. Due by the last day of class.
- Team Design Project:** Each student will participate in a team project to evaluate and complete a preliminary design of a small scale renewable energy project. The projects will be presented to the class on the last day. Part of your grade will be from your teammates. See *Design Project Instructions.doc* for details.
- Optional Extra Credit:** Write a report or do a presentation on a book, video, lecture or service project connected with renewable energy or a related topic. Each report or presentation is worth a possible 10 points and you may do two. See *Instructions for Extra Credit Report on Book_Video_Lecture.doc* for details. Due on the last day of class.
- Final Exam:** An on-line comprehensive final exam will be given at the end of the semester. You may use a calculator and any printed or online resources, but you must do your own work.
- Make-up/Re-take:** You may be able to complete or make-up labwork during the Saturday morning Open Lab, depending on the lab and the availability of your instructor. Quizzes missed may not be made up, however the grade for any missed quizzes will be raised to match your final exam grade percentage.

Grading: Your final grade will be based on the total number of points accumulated during the semester as shown below.

Grading Components	Points Possible (approx.)
Quizzes (10 pts each)	100
In-class exercises (10 pts each)	80
Individual book/video/lecture report or presentation	20
Team Project: Design of a small-scale renewable energy system	90
Optional Extra Credit report or presentation (20 – 40 points)	-
Final Exam	40
Total	330

Letter grades will be assigned according to the following scale.

A	93 - 100 %	B-	80 - 82 %	D+	67 - 69 %
A-	90 - 92 %	C+	77 - 79 %	D	63 - 66 %
B+	87 - 89 %	C	73 - 76 %	D-	60 - 62 %
B	83 - 86 %	C-	70 - 72 %	F	0 - 59 %

- W Withdrew from class by submitting a drop form to Student Records or making a request in writing.
 I An incomplete may be given in the event of extreme circumstances near the end of the semester when only a few assignments remain to be completed

- Please Note:**
- Please keep drink containers covered, and take responsibility for disposing of your trash and repairing any damage done to equipment from spilled drinks.
 - Container recycling bins in the classrooms and in the TI building lobby are for all glass, plastic and metal beverage containers.
 - Paper recycling bins in the classrooms and hallways are provided for office and notebook paper and grayboard (no napkins, tissues, etc.)
 - Trash containers are provided for all your non-recyclables. Please clean off your bench at the end of each class.
 - Please remove your personal flash drives and diskettes at the end of each lab.
 - Multi-meters and tools are available on request for use in class. Ask your instructor if you need help finding them. At the end of class, please return whatever you have borrowed.

- Support:**
- Extra help is available from your instructor after class, during office hours or by appointment.
 - You can contact any of your classmates by email through BlackBoard.
 - *Learning Support Services* provides tutoring for all enrolled students. Please see the schedule posted outside LA 104 as times may change each semester. If you need an academic accommodation because of a disability, please advise me and make an appointment with Learning Support Services as soon as possible to verify the disability and arrange accommodations. Call (734) 973-3342 or stop by LA 104, Monday – Friday, 8-5.

Washtenaw Community College Board of Trustees Policies

4095 -- STUDENT RIGHTS AND RESPONSIBILITIES

Academic Dishonesty

All forms of academic dishonesty including but not limited to collusion, fabrication, cheating, and plagiarism will call for discipline.

1. Collusion is defined as the unauthorized collaboration with any other person in preparing work offered for individual credit.
2. Fabrication is defined as intentionally falsifying or inventing any information or citation on any academic exercise.
3. Cheating is defined as intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise.
4. Plagiarism is defined as the appropriation of any other person's work and the unacknowledged incorporation of that work in one's own work offered for credit.

8085 -- SMOKE-FREE CAMPUS POLICY

Smoke in the workplace has become an important public health issue. There is considerable evidence that concentrations of smoke are harmful to non-smokers as well as to smokers. The College has an obligation to provide a safe and healthy work and learning environment. Any employee, student, or visitor has a right not to be exposed to the effects of smoke. Washtenaw Community College, therefore, establishes the following non-smoking policy for all College-owned facilities.

Policy Statement:

Effective September 1, 2005, Washtenaw Community College will become a smoke-free campus. Smoking will not be permitted anywhere on the campus; this includes all College facilities, including buildings, sidewalks, parking lots, building entrances, and common areas. The Administration shall fully implement this policy, and all applicable laws, regulations, and local ordinances related to smoking.

ELE 106 Renewable Energy Technology – Winter 2013 Course Outline (tentative)

Instructor: Dale Petty email: petty@wccnet.edu phone: 734-677-5108

Class	Date	Lecture/Discussion Topics	Lab	Due dates: 12:30 pm on the day listed
1	1/15	Why Renewable Energy?	Plan B 4.0: Preface, Ch 1, 3 MacKay: Ch 1 Solar Living: Intro, Ch 1	
2	1/22	Energy Consumption & Conservation	Carbon Footprint and Reduction	Blackboard Exploration, Student Profile Pre-test, Online Quiz 1 Bring Household Driving and Flying Data to class
3	1/29	Electrical Fundamentals	Electrical Fundamentals	Carbon Footprint and Reduction Report, Online Quiz 2
4	2/5	Solar Power Resource	Solar Resource	Online Quiz 3
5	2/12	Solar Electric Systems & Components	Solar Panel Testing	Project proposals Online Quiz 4
6	2/19	Solar Electric Design & Installation – Part 1	Grid-tied Photovoltaic Sizing	Project selection Online Quiz 5
7	2/26	Solar Electric Design & Installation – Part 2	Battery Sizing	Project team building & goal statement Online Quiz 6
	(3/5)	No Class – Winter Recess		
8	3/12	Renewable Economics	Economic Analysis Tools	Select Book or Video for Individual Report Online Quiz 7
9	3/19	Solar Thermal	Solar Hot Water Sizing	Project resource report Online Quiz 8
10	3/26	Wind Power	Generators and Alternators	Online Quiz 9
11	4/2	Hydroelectric Power	Micro Hydro Sizing	Online Quiz 10
12	4/9	Geothermal & Heat Pumps	Tour of OE Geothermal equipment	Project Design Online Quiz 11
13	4/16	Biomass		Project economic analysis Online Quiz 12
14	4/23	TBA		Project written report
15	4/30	Project presentations		Project presentation and evaluations
	5/5 11:00pm			Deadline for Final Exam (on Blackboard)