

Department of Agricultural Sciences College of Sciences and Engineering Technology Sam Houston State University

Renewable Energy Sources for Agriculture

AGRI 4393 Fall 2017 Syllabus

Part 1: Course Information

Instructor Information

Instructor: Dr. P. Ryan Saucier, Office: HAETC 106 & Pirkle 440C
Lecture Time(s): Monday & Wednesday, 11:00 a.m. – 11:50 a.m., HATEC 100
Laboratory Time: Monday, 3 – 5 p.m., HATEC 100
Virtual Office Forum: Available 24/7 for posting/viewing questions
Office Hours: Monday: 9 - 10 a.m., 1-3 p.m.; Tuesday: 9 to 9:30 a.m., Wednesday: 9 - 10 a.m. & 3 – 5 p.m.; Thursday 9 – 9:30 a.m.
Email: ryansaucier@shsu.edu
Office Telephone: 936-294-4883
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Course Description

This course will familiarize students will existing and potential alternative energy sources and production capacities including wind, solar, bio-mass conversion, hydrogen, ethanol, vegetable oil, and bio-diesel. Impacts on the environment, ecological systems, world food supply, and economy will be studied.

Textbook & Course Materials

Required Text

- Dunlop, J. P. (2012). *Photovoltaic systems* (3rd ed.). American Technical Publishers, Inc. ISBN # 978-1-935941-05-7
- International Pipe Trades Joint Training Committee, Inc. (2013). Solar water heating systems: Fundamentals and installation (1st ed.). American Technical Publishers, Inc. ISBN # 978-0-8269-1279-4
- Course Packet at Eagle Graphics AGET 4393 Saucier

Recommended Texts & Other Readings

• Other resources posted on Blackboard or handed out in lecture or lab

Course Structure

This course will be delivered in person through lecture and laboratory. Some portions of the course may be delivered through the course management system BlackboardTM. You will use your SHSU account to login to the course from the Blackboard login page (http://shsu.blackboard.edu).

In Blackboard, you may access online lessons, course materials, and resources. At designated times throughout the semester, we will participate in a blend of self-paced and group-paced activities using Backboard and additional internet-based technologies.

Activities may consist of chat, blogs, discussion forums, journaling, wikis, and web postings.

Technical Requirements

You must have access to a personal computer or a computer in which you have administrative rights so that you may install necessary plugins. See the <u>Technical</u> <u>Requirements</u> website for recommended system and browser requirements.

- Internet connection (DSL, LAN, or cable connection is desirable)
- An active SHSU Student Username and Password
- Webcam and headset (headphone/microphone combo) Using headphones will eliminate the echoing effect of the microphone picking up audio from the computer speakers during live discussions.

Technical Assistance

The team at SHSU Online provides technical support for Blackboard through a variety of methods.

Website: Technical Support http://distance.shsu.edu/tech-support

Phone: 936-294-2780 – or – toll free 1-877-759-2232

Email: <u>blackboard@shsu.edu</u> or you can chat with a technician while inside your Blackboard course.

Below are some helpful resources if you wish to explore on your own.

- New students should start with the <u>Online Student Orientation</u> http://distance.shsu.edu/current-students/orientation.html
- A list of other helpful services can be found on the <u>Student Resources</u> page http://distance.shsu.edu/current-students/resources.html
- Blackboard LearnTM provides a variety of video tutorials at <u>Student Videos</u> https://help.blackboard.com/en-us/Learn/Reference/Blackboard_Learn _Videos/Student_Videos

Part 2: Course Objectives

- Relationships between fossil and alternative energies
- World and U.S. consumption of energy
- Alternative fuels to replace and supplement fossil fuels
- Limitations and benefits of alternative energy utilization
- Alternative energy effects on the environment, ecological systems, world food supply, and economies
- Role of U.S. and Texas in alternative energy production and existing nonrenewable energy resources
- Green building practices

- Political and practical implications of pursuing a national and world wide agenda of significantly increasing the utilization of alternative energy sources
- Future use of nuclear energy and associated problems
- Careers and leadership opportunities in the alternative energy sector

You will meet the objectives listed above through a combination of the following activities in this course:

Lecture/Laboratory

Exams (2) x 100 points each =	200 points
Quizzes (4) x 50 points each =	200 points
Research Paper = (Due November 8, 2017)	100 points
Student Research Presentation =	100 points
Labs (8) x 25 points =	200 points
Chapter Review Comprehension Questions (10) x 10 points =	100 points
Online SEI and LEED certificates (4) x 25 points = (Due November 29, 2017)	100 points

Total Points =

1000 points

Final Grade Assignment

Part 3: Topic Outline/Schedule

Important Note: Refer to the course calendar for specific meeting dates and times. Activity and assignment details will be explained in detail within each week's corresponding learning module.

Wk.	Date(s)	Lecture Topic	Assigned Reading	Laboratory Topic
1	8/23	Energy Use in the World & U.S.	Handouts	Lab Orientation
2	8/28 & 8/30	Non-Renewable Energy Sources Renewable Energy Sources Alternative Energy Uses in Agriculture – an Overview	PP and Handouts	Alternative Energy
3	9/4 & 9/6	Introduction to Photovoltaic Systems Solar Radiation Site Surveys and Preplanning	PS 1,2,3	Alternative Energy
4	9/11 & 9/13	System Components and Configurations Cells, Modules, and Arrays Quiz # 1 CRCQ #1 Due	PS 4, 5	Lab # 1

Class	Schedule.	Lah	Schedule.	and	Reading	Assignments
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14	11/20	Wind Energy	Handouts	Student Research Presentations
13	11/13 & 11/15	Biofuels, Agriculture, and Land Use Cost/ Benefits of Biofuels Food vs. Fuel CRCQ #9 Due	Handouts	Lab # 8
12	11/6 & 11/8	Installing and Wiring Operational Control Systems CRCQ #8 Due Research Papers Due 11/8/17	SWHS 11	Student Research Presentations
11	10/30 & 11/1	Site Assessment Solar Collection Installation Installation of Solar Storage Tanks, Piping, and System Components CRCQ #7 Due Quiz # 3	SWHS 8,9,10	Lab # 7
10	10/23 & 10/25	Solar Water Heating System Design and Layout Solar Water Heating System Installation Safety CRCQ #6 Due	SWHS 6,7	Lab # 6 Guest Speaker
9	10/16 & 10/18	Collectors Solar Water Heating System Components Solar Water Heating System Operation Fundamentals CRCQ #5 Due	SWHS 3,4,5	Lab # 5 Sandra Gray – SHSU Energy Mgmt.
8	10/9 & 10/11	Mid Term Exam # 1 (10/4) Introduction to Solar Thermal Technology Solar Thermal Principles CRCQ #4 Due	SWHS 1,2	Lab # 4
7	10/2 & 10/4	System Sizing Mechanical Integrations Electrical Integration Utility Interconnection CRCQ #3 Due Ouiz # 2	PS 9,10,11,1 2	Lab # 3
6	9/25 & 9/27	No Class – Work on Research Paper/Presentation		None
5	9/18 & 9/20	Batteries Charge Controllers Inverters CRCO #2 Due	PS 6,7,8	Lab # 2

15	11/27 & 11/29	Wind Energy Student Research Presentations CRCQ #10 Due Quiz # 4	Handouts	Student Research Presentations
16		Final Exam, 12/06/2017 from 12:00	to 2:0 p.m.	

Part 4: Grading Policy

Graded Course Activities

Late Work Policy

Be sure to pay close attention to deadlines-there will be **no make-up assignments**, **quizzes**, **or other course materials accepted beyond the due date without instructor approval** <u>and</u> **advanced notification**.

Viewing Grades in Blackboard

Points you receive for graded activities will be posted to the Blackboard Grade Center. Your instructor will update the online grades each time a grading session has been complete—typically 7 days following the completion of an activity. **However, research papers may take longer to grade.** Click on the My Grades link in the left navigation pane to view your points.

Letter Grade Assignment

Include an explanation between the relationship of points earned and final letter grade. Example: Final grades assigned for this course will be based on the percentage of total points earned and are assigned as follows:

Letter Grade	Percentage	Performance Level
А	89.1-100%	Excellent Work
В	79.1-89.0%	Good Work
С	69.1-79.0%	Average Work
D	59.1-69.0%	Poor Work
F	00.0-59.0%	Failing Work

Service Learning Opportunities

This course involves service to the community with opportunities to participate in activities outside of lecture and lab for extra credit. For students to gain extra credit, students are **required to complete 10 hours of work towards these projects**. These events will be announced throughout the semester. **Of the 10 required hours, 6 must be completed at the SHSU HAET Center**. The **remaining 4 may be completed with a preapproved activity** and location such as a LDE or CDE. Also, students may undertake

a preapproved independent project that will enhance the SHSU HAET Center or the local community. Students may earn up to 100 points through service learning.

Assignments

- Exams each exam can consist of: multiple choice, short answer, essay, and hands-on technical questions. The student will have 50 minutes to complete each exam. Students are encouraged to e-mail the instructor sample questions for each exam. These sample questions are worth an additional 5 points on each exam and must be in <u>multiple</u> <u>choice format</u> (*4 answer choices, the correct answer must be indicated as well*). Sample questions must be emailed to Dr. Saucier <u>no later than 48 hours prior to the exam</u> for credit. Each exam is worth 100 points. There will be two exams, a mid-term and a final exam.
- 2. Quizzes each quiz can consist of: multiple choice, short answer, essay, and hands-on technical questions. The student will have 20 minutes to complete each quiz, worth 50 points each. A total of 4 quizzes worth a total of 200 points. These may be delivered in an online format.
- **3. Research Paper -** each student will write a research paper about emerging agricultural systems technology. This paper will be **due November 08, 2017 at the start of lecture.** This paper is worth 100 points.
- 4. Student Research Presentation each student will present a 20-minute presentation concerning their research paper topic. This presentation will be in Microsoft PP format, and will be emailed to Dr. Saucier, 2 days prior to the presentation date. Students will also develop 10 short answer or multiple choice questions as well. This presentation is worth 100 points.
- **5.** Laboratories each student will attend and participate in each laboratory. An activity worksheet or summary report will be required from each student. A total of 8 laboratories, worth 25 points each, for a total of 200 points.
- 6. Chapter Review Comprehension Questions each student will write (10) sets of chapter review comprehension questions over the assigned readings. The format shall be: single space, 12-point font, 1" margins, Times New Roman and include a cover sheet. For each CRCQ, the student will write 10 multiple choice questions that will include 4 answer choices (A-D) and must indicate the correct answer. Students also must include a reference to where the correct answer was found in the text or Power Point presentation. 10 reports x 10 points each = 100 points

7. Online SEI and LEED Certifications

Solar Energy International RE100: Introduction to Renewable Energy Certificate - each student will complete a free, 100% online course from Solar Energy International entitled RE100: Introduction to Renewable Energy, <u>http://www.solarenergy.org/courses/introduction-to-renewable-energy/</u>. This course is 6 weeks long requiring the student to work 2 hours per week on the course content. Students must complete this course by November 29, 2017 at 11 a.m. to receive credit. Students will print off the certificate for credit. 25 points.

Leadership in Energy and Environmental Design – each student will complete a free, 100% online course from the U.S. Green Building Council (USGBC). These online courses require about 2 hours each. Students must complete this course by November 29, 2017 at 11 a.m. to receive credit. Students will print off the certificate for credit. 25 points each.

Courses:

LEED 101: Green Building Basics & LEED PEER 101: Introduction to Sustainable Electricity and PEER USGBC+ Transforming our Built Environment <u>http://www.usgbc.org/</u> <u>http://www.usgbc.org/registration/create-user</u> <u>http://www.usgbc.org/education-at-usgbc/listing/basic</u>

Graduate Credit

For graduate credit, graduate students will develop a Microsoft Power Point (30 minutes in length) over an alternative energy topic of the student and the instructor's choice. Graduate students will also develop a 10 question quiz, and provide 3 handouts from reputable sources that provide background knowledge about the topic.

Name:	Possible Points	Points Earned
Grading Criteria		
Content of the Project (3-5 pages plus cover page and		
references)		
• Did the author explain the	20	
process/research/technology?		
• Did the author explain the impact of the	20	
process/research/technology?		
• Did the author discuss the future of the	20	
process/research/technology and any challenges		
associated with the process/research/technology?		
Additional Materials Provided for the Project		
• Variety (Handout, pictures, etc.)	10	
• Accuracy of information (Was the information up to	10	
date and not dated?; No older than 5 years)		
Quality of Writing		
Grammar, Punctuation, Spelling	5	
• Organization (APA, 6 th ed.)	5	
References	10	
Total Points	100	

Emerging Technology Paper Grading Rubric

Paper Format

- 12-point font, Times New Roman, 1" margins all sides, single spaced, APA 6th edition formatting
- Students may use up to a ½ page of pictures in the paper to explain the process/research/technology or place them as an appendix at the end of the paper
- Students must use in citations in the text and list these citations on a reference page in alphabetical order per APA style
- No abstract is needed for this paper
- 5 additional points added for peer review and edits
- 5 additional points if paper is reviewed by the SHSU Writing Center

Example of an APA Style Reference Page

References

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory.

Englewood Cliffs, N.J.: Prentice Hall.

Bandura, A. (1997). Self-efficacy: The exercise of control, New York, NY: W.H. Freeman.

- Borich, G. D. (1980). A needs assessment model for conducting follow-up studies. *The Journal* of Teacher Education, 31(3), 39-42. doi: 10.1177/002248718003100310
- Burris, S., Robinson, J. S., & Terry, Jr., R. (2005). Preparation of preservice teachers in agricultural mechanics. *Journal of Agricultural Education*, 46(3), 23–34. doi:10.5032/jae.2005.03023

Example(s) of In-Text Citiations:

Summary of Concpets, Ideas, or Written Word:

These professionals include school-based agricultural educators who must possess the knowledge and skills needed to prepare a diverse workforce to address societal and industry challenges (Doerfert, 2011).

Harlin, Roberts, Dooley, and Murphrey (2007) found that the skills and knowledge required of these teachers far exceed those of secondary teachers who instruct other academic subject matter.

Direct Quote of Work:

This area of school-based instruction has been noted as an important component of "any high quality agricultural education program" (Phipps, Osborne, Dyer, & Ball, 2008, p. 303).

Name:	Possible	Points
	Points	Earned
Grading Criteria		
Content of the Presentation		
• Did the presenter give a detailed background on the technology?	15	
• Did the presenter explain the technologies contribution to industry/society?	15	
• Did the presenter discuss the future of the technology and any challenges associated with the technology?	15	
Quality of the Presentation		
• Clarity (Could we understand you speaking? Volume? Clarity in Voice?)	5	
• Variety & Questions (handouts, videos, etc.)	5	
• Enthusiasm (Did you seem motivated? Excited? Enthusiastic?)	5	
• Task- oriented, business- like behavior/dress (Business casual is acceptable as a minimum)	5	
• Opportunity for students to apply concepts learned for future endeavors	5	
• Appropriate use of time (20 minutes)	5	
100% attendance at all student presentations	25	
Total Points	100	

Student Research Presentation Grading Rubric

Part 5: Course Policies

Attendance

Regular and punctual class attendance is expected of each student at Sam Houston State University. This course will consist of both synchronous (scheduled) and asynchronous activities. Synchronous activities are outlined in the course schedule. Please make it a habit to visit the course home page periodically throughout the week to check for announcements. If applicable, timely entry into online meeting spaces will be expected during those scheduled times.

Participate

Students are expected to participate in all activities as listed on the course calendar. Failure to participate in lecture and laboratory activities often results in students earning poor grades in the course.

Code of Conduct

As a member of a community dedicated to learning, inquiry, and creation, the students, faculty, and administration of our university live by principles that require all members to be conscientious, respectful, and honest. Students should also understand that honest conduct reaches far beyond just academic honesty.

Completing Assignments

Assignments must be submitted by the given deadline or special permission must be requested in advanced from the instructor <u>before the due date</u>. NO LATE WORK IS ACCEPTED!

Understand When You May Drop This Course

It is the student's responsibility to understand when he/she may need to consider unrolling from a course. Refer to the SHSU Course Schedule for dates and deadlines concerning registration.

Classroom Electronics Policy

Each student is expected to display professional behavior in the classroom and laboratory in terms of using electronic devices, i.e. cell phones, PDA, computers, iPad, tablets, etc. This means only using electronic devices in class or laboratory when needed to enhance educational purposes, i.e. no texting, using social media websites, etc. If you need to text or make a phone call, please step out of class to avoid disrupting your classmates. Violation of this policy could result in your expulsion from class/ laboratory if your activity interferes with learning.

Required Personal Protection Equipment (PPE) and Supplies

Students are required to have the following PPE and materials for the laboratory:

- OSHA Z87.1 Approved Safety Glasses
- Closed toe, shoes or boots (No sandals, no flip flops, etc.)
- Appropriate clothing required on tours

Required Policies at SHSU

The following are mandatory policies and procedures practiced by Sam Houston State University and can also be found at <u>http://www.shsu.edu/syllabus/</u>.

Academic Dishonesty

The University expects students to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experience both in and out of the classroom. Accusations of academic dishonesty, proceedings, and subsequent disciplinary actions are addressed in The Texas State University System, Board of Regents policy on <u>Academic Honesty, Chapter VI, Subsection 5.3, "Academic Honesty"</u> and in the University's <u>Academic Policy Statement 810213</u>.

Student Absences on Religious Holy Days Policy

Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examination, for the observance of a religious holy day, including travel for the purpose. Section 51.911(a)(2) defines a religious holy day as: "a holy day observed by a religion whose places of worship are exempt from property taxation under Section 11.20..." A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.

University Policy 861001 provide the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe a religious holy day shall present to each instructor involved a written statement concerning the religious holy day. The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed. This policy is fully addressed in <u>Academic Policy Statement</u> <u>861001</u>.

Students with Disabilities Policy

It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance are expected to visit with the <u>Services for Students with</u> <u>Disabilities</u> office located in the Lee Drain North Annex and can be contacted by phone at 936-294-3412 (Voice), 936-294-3786 (TDD), or via email at <u>disability@shsu.edu</u>. They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Counseling Center and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Counseling Center. This policy is fully addressed in <u>Academic Policy Statement 811006</u>.

Visitors in the Classroom

Only registered students may attend class. Exceptions can be made on a case-by-case basis by the professor. In all cases, visitors must not present a disruption to the class by their attendance. Students wishing to audit a class must apply to do so through the Registrar Office.