



IMPERIAL VALLEY COLLEGE

Class Syllabus

Fall 2013

Class title:	RNEW-118 Alternative Energies
Instructor:	John Fahim
Phone & E-mail:	Cell: 909-717-3785 john.fahim@imperial.edu
Classroom	1307
Laboratory:	1307

Class Schedule:

Tuesday and Thursday 01:30PM – 04:40PM, August 20 to December 05, 2013

Course Description:

This course provides the student with instruction, which meets NSF Alternative Energy Program and NABCEP guidelines, and as part of the Solar PV & Thermal Technician Certification, qualifies the student to take the NABCEP Solar Entry Level PV and SH Exams, instruction is in basic principles of electrical Alternative Energy Systems. Instruction will include an introduction to energy usage, Ocean and Hydro-power, Solar Energy, Wind Energy, bio-energy, combustion turbines, Hydrogen economy and Fuel Cells, Combined Heat and Power systems, Geothermal, Nuclear, Smart Grid, Energy and data acquisition systems based on LabVIEW software. Energy efficiency and sustainability principles of these systems will be the focus of instruction.

Student Learning Outcomes (SLO)

Upon course completion, the successful student will have acquired new skills, knowledge, and or attitudes as demonstrated by being able to:

1. Describe the operation of Hydropower plants. (ILO1, ILO2)
2. Explain the different types of combustion turbines. (ILO1, ILO2)
3. Describe the fundamental blocks of Solar Energy systems and their architecture. (ILO1, ILO2)
4. Describe the fundamentals of Geothermal, Ocean, Nuclear and Hydrogen Energy systems. (ILO1, ILO2)

Institutional Student Learning Outcomes (ISLO)

Student learning outcomes are written statements that represent faculty and departmental learning goals for students. After successful completion of the program or degree at Imperial Valley College, students are expected to have measurable improvement in the following areas:

- ISLO 1: Communication Skills
- ISLO 2: Critical Thinking Skills
- ISLO 3: Personal Responsibility
- ISLO 4: Information Literacy
- ISLO 5: Global Awareness

Lecture & Laboratory Course Goals and Objectives:

Upon successful completion of this course, the student will be able to:

1. Explain Energy usage in the United States within global usage.
2. Identify Smart Grid definition, and components including; energy storage, distributed generation, and sustainable energy hybrid systems.
3. Describe the fundamental blocks of Solar Energy systems including Solar Thermal and photovoltaic systems.
4. Describe the operation of Hydro-power plants and ocean power systems.
5. Describe the fundamentals of Geothermal and Nuclear Energy systems.
6. Define and describe the general principles related to wind energy.
7. Explain turbo machinery and the different types of combustion turbines.
8. Define Hydrogen economy and the operation of Fuel Cells, advantages and disadvantages.
9. Identify and analyze Combined Heat and Power systems.
10. Identify bio-energy as a source of fuels for sustainable power generation.
11. Explain and practice the use of energy and data acquisition systems based on LabVIEW software.

Attendance and Grading Criteria:

1. Attendance: Regular attendance in all classes is expected of all students enrolled. All students must have an acceptable explanation for every day of absence and or tardiness.
2. Maximum absences limit is more than two classes' absences after the close of registration (Aug. 31, 2013).
3. A student may exclude (drop) him / herself from further attendance in a class during the semester when absences, after the close of registration (Aug. 31, 2013) and before (Nov. 09, 2013), have exceeded the above maximum absences limit.
4. Tardiness: Non-acceptable three times' tardiness equals to one absence.
5. Student Conduct: Upon entry into IVC constitutes the student's acceptance of the standards of student conduct and the regulations publish by the college.
6. Each student is responsible for making up schoolwork missed because of absences. Students may receive the full grade for made-up schoolwork only for valid acceptable absence reason. For no show no call absence, students may receive class schoolwork points multiplied by attendance percentage.
7. Grading system:
 - A=90%-100% of points= Excellent
 - B=80%-89% of points= Good
 - C=70%-79% of points= Satisfactory
 - D= 60%-69% of points= Pass, less than satisfactory
 - F= Less than 60% of points= Failing
6. Exams:
 - **Mid-Term** (60 points) will be given on Oct. 10, 2013.
 - **Final-Exam** (60 points) will be given on Dec. 05, 2013.
 - There are no make-up exams unless you have a valid acceptable reason and make arrangements with the instructor before the exam.

- **Final grades can be raised or lowered based on your attendance, preparation and participation in class. It benefits you to be engaged and participative.**

Grades:

	Points
Book worksheets, quizzes.	140
Lab activity, hands-on worksheets and Fieldtrips.	240
Attendance percentage will be applied to the above points	Percentage of above Points
Mid-term	60
Final-exam	60
Total points	500

Course Grade:

The course grade is based on total points accumulated during the semester. There is a total of 500 points available. Grades are determined by dividing the total points you earn by the total points available to get your percentage. (Total points may vary if we change the assignments in a particular week).

Grading of Hands-on Assignments:

The most common problem students experience is not being detailed enough in their answers and not spending the right amount of time in the lab procedures. Always be as specific as you can and use examples from your readings. Make sure to answer all parts of the questions. Points will be deducted for inadequate responses. Feedback will be given after each assignment and, hopefully, you will improve as you proceed with the course. The following grading rubric is used when grading assignments.

	Grading Rubric for Hands-on Assignment	Points
A	Focused and clearly organized. Contains critical thinking and content analysis. Convincing evidence is provided to support conclusions. Ideas are clearly communicated. Clearly meets or exceeds assignments requirements.	18-20
B	Generally focused and contain some development of ideas, may be simplistic or repetitive. Evidence is provided which supports conclusions. Meet assignments requirements.	16-17
C	May be somewhat unfocused, underdeveloped, or rambling. But does have some coherence. Some evidence is provided which support conclusions. Meets minimum assignment requirements.	14-15
D	Unfocused, underdeveloped. Minimal evidence is used to support conclusion. Does not respond appropriately to the assignment.	12-13
C	Minimal effort by the student. Unfocused, underdeveloped. Evidence is not used to support conclusion. Block overall understanding. Does not meet assignment requirements.	0-11

Method of Instruction:

Methods of instructions may include, but are not limited to, the following: lectures, textbook worksheets, hands-on worksheets, internet readings, large and small group discussions, audiovisual aids, and demonstrations.

Student Responsibility:

1. Participate in class; turn in all your completed assignments to the instructor. Must follow safety rules at all times in the lab area.
2. Scantron answer sheets and #2 pencils on test days.
3. If you are having trouble with the course and/or personal problems, communicate with the instructor, as soon as possible to get the help needed.
4. If you have any form of disability, please inform the instructor so that you can get the assistance you may need. Please contact DSPS office as soon as possible: 355-6312, 2100 Bldg. We have made every effort to ensure that this course is accessible to all students, including students with disabilities. If you encounter any problem during this course, please contact me immediately.
5. Please, no food, smoking, or visitors during class.
6. Anyone using a cell phone/pager or other communication device, or carrying a device that makes noise, during class will be asked to leave and will receive only partial points. Please refer to IVC catalog for more information.
7. Students have the right to experience a positive learning environment; students who disrupt that environment can be asked to leave the class. Please refer to IVC catalog for more information. Swearing, put downs and discriminatory statements will not be tolerated. If someone says anything to you that may make you feel uncomfortable or that you feel is inappropriate contact your instructor immediately.

Lab Rules and Regulations:

Every student must follow safety standards according to the OSHA safety procedures *at all times during lab practice*.

Nondiscrimination & Sexual Harassment Policy:

IVC does not discriminate in the admission nor in the offering of programs and activities because of ethnic group identification, national origin, religion, sex, age, race, color, medical conditions, Vietnam era status, ancestry, sexual orientation, marital status, or physical or mental disability or because he or she is perceived to have one or more of those characteristics. (Refer to IVC catalog).

Textbooks:

Renewable Energy in Power Systems, Leon Freris, John Wiley & Sons, Ltd, Publication
ISBN 978-0-470-01749-4

Hodge, B.K. (2010). Alternative Energy Systems, Wiley. ISBN: 9780470142509

William H. Kemp. The Renewable Energy Handbook.

Course Instructional Schedule and Learning Activities:

Date	Objectives
Week 1 August 20-22	<ul style="list-style-type: none">• Class Outline and Rules• Class Safety
Week 2 August 27-29	<ul style="list-style-type: none">• Global Energy introduction• Energy usage in the U.S.
Week 3 September 03-05	<ul style="list-style-type: none">• Smart Grid definition, and components• Lab.
Week 4 September 10-12	<ul style="list-style-type: none">• Describe the fundamental blocks of Solar Energy systems PV and Thermal – Lab.
Week 5 September 17-19	<ul style="list-style-type: none">• Hydro-power plants – Fieldtrip TBD• Ocean power systems – Lab.
Week 6 September 24-26	<ul style="list-style-type: none">• Fundamentals of Geothermal• Nuclear Power Plants – Lab.
Week 7 October 01-03	<ul style="list-style-type: none">• Wind Energy – Lab.
Week 8 October 08-10	<ul style="list-style-type: none">• Mid-Term
Week 9 October 15-17	<ul style="list-style-type: none">• Turbo machinery and the different types of combustion turbines – Fieldtrip TBD
Week 10 October 22-24	<ul style="list-style-type: none">• Hydrogen economy – Lab.
Week 11 October 29-31	<ul style="list-style-type: none">• Fuel Cells usage, advantages and disadvantages – Lab.
Week 12 November 05-07	<ul style="list-style-type: none">• Combined Heat and Power systems – Lab.
Week 13 November 12-14	<ul style="list-style-type: none">• Bio-energy as a source of fuels for sustainable power generation – Lab.
Week 14 November 19-21	<ul style="list-style-type: none">• Subject 10 Geothermal, Ocean, and Nuclear Energy – Lab.
Week 15 November 26	<ul style="list-style-type: none">• Final data acquisition systems LabVIEW practice.
Week 16 December 03-05	<ul style="list-style-type: none">• Final Exam

Fieldtrips are being scheduled and may cause changes to the above **Course Instructional Schedule**.

In Case of Emergency:

If you have a life-threatening illness or injury that requires an ambulance, **call 911 immediately**. Emergency costs are not covered by Student Health Services.

The Student Health Fee allows the students to receive health services on campus and at various health centers in the community. For more information refer to catalog.