Syllabus for CT 33 – Photovoltaic Systems

Course Information
Semester & Year: **Fall 2024**
Course ID & Section #: **CT-33-E7458**
Instructor's name: **Robert Satava**
Day/Time of required meetings: **T 6:05pm-9:15pm**
Location: **HU 129**
Course units: **3**

Instructor Contact Information
Office location: **N/A**
Office hours: **N/A**
Phone number: **N/A**
Email address: **robert-satava@redwoods.edu**

Textbook
Photovoltaic Systems, 3rd edition by James P. Dunlop (ISBN: 978-1-935941-05-7)

Catalog Description
A course designed to provide students with essential information and training to work with residential solar photovoltaic systems including providing fundamentals of AC/DC, the National Electric Code, and principles of a residential solar photovoltaic systems. The course content is aligned with the North American Board for Certified Energy Practitioners (NABCEP) PV Entry Level Exam. Students will be given the opportunity to sit for the NABCEP exam at the conclusion of the course.

Course Student Learning Outcomes *(from course outline of record)*
1. Conduct a solar site analysis to determine if a site is appropriate for a solar photovoltaic (PV)system installation.
2. Properly size and calculate the cost of a solar photovoltaic system with regards to electrical load, solar resource data and type of solar system.
3. Identify building codes specific to solar photovoltaic (PV) systems.

Prerequisites/co-requisites/ recommended preparation
None

Educational Accessibility & Support

College of the Redwoods is committed to providing reasonable accommodations for qualified students who could benefit from additional educational support and services. You may qualify if you have a physical, mental, sensory, or intellectual condition which causes you to struggle academically, including but not limited to:

- Mental health conditions such as depression, anxiety, PTSD, bipolar disorder, and ADHD
- Common ailments such as arthritis, asthma, diabetes, autoimmune disorders, and diseases
- Temporary impairments such as a broken bone, recovery from significant surgery, or a pregnancy-related disability

- A learning disability (such as dyslexia, reading comprehension), intellectual disability, autism, or acquired brain injury
- Vision, hearing, or mobility challenges

Available services include extended test time, quiet testing environments, tutoring, counseling and advising, alternate formats of materials (such as audio books or E-texts), assistive technology, on-campus transportation, and more. If you believe you might benefit from disability- or health-related services and accommodations, please contact [Disability Services and Programs for Students (DSPS)](). If you are unsure whether you qualify, please contact DSPS for a consultation: [dsps@redwoods.edu]().

DSPS office locations and phone numbers

Eureka campus
- Phone: 707-476-4280
- Location: Student Services Building, first floor

Del Norte campus
- Phone: 707-465-2324
- Location: Main Building, next to the library

Klamath-Trinity campus
- Phone: 707-476-4280

Admissions deadlines & enrollment policies

Fall 2024 Dates

Date	To Remember
August 23	Last day to register for classes (day before the first class meeting)
August 24	Classes begin
August 30	Last day to add a class
September 2	Labor Day Holiday (district wide closure)
September 6	Last Day to Drop & Receive a Refund
September 8	Last Day to Drop w/out a "W"
September 9	Census Date (20% of class)
October 31	Last Day to Petition to Graduate & Petition for Certificate
November 1	Last Day for Student/Faculty Withdrawal
November 11	Veteran's Day Holiday (District Wide Closure)
November 25-26	Fall Break (No Classes)
November 27-29	Thanksgiving Holiday (District Wide Closure)
December 14-20	Final Examinations

Date	To Remember
December 20	Last Day to File P/NP Option
December 20	Semester Ends
December 27	Grades Due
January 3	Grades Available for Transcript Release

Academic dishonesty

In the academic community, the high value placed on truth implies a corresponding intolerance of scholastic dishonesty. In cases involving academic dishonesty, determination of the grade and of the student's status in the course is left primarily to the discretion of the faculty member. In such cases, where the instructor determines that a student has demonstrated academic dishonesty, the student may receive a failing grade for the assignment and/or exam and may be reported to the Chief Student Services Officer or designee. The Student Code of Conduct (AP 5500) is available on the College of the Redwoods website. Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the College Catalog and on the College of the Redwoods website.

AI Use Class Policy

Recent advancements in generative artificial intelligence (AI) have made large language models such as ChatGPT and Google's Bard widely available. However, overuse of these tools in this class can undermine your learning and curtail the development of your critical and creative thinking skills. In addition, AI outputs are often unreliable and frequently subject to bias. For these reasons, the policy of this class is that AI cannot be used at any point in the completion of class assignments, including discussion posts. Any or all of your assignment submissions and discussion posts may be screened by AI detection software, but the real penalty for AI misuse is that you will miss out on an opportunity to learn.

Disruptive behavior

Student behavior or speech that disrupts the instructional setting will not be tolerated. Disruptive conduct may include, but is not limited to: unwarranted interruptions; failure to adhere to instructor's directions; vulgar or obscene language; slurs or other forms of intimidation; and physically or verbally abusive behavior. In such cases where the instructor determines that a student has disrupted the educational process, a disruptive student may be temporarily removed from class. In addition, the student may be reported to the Chief Student Services Officer or designee. The Student Code of Conduct (AP 5500) is available on the College of the Redwoods website. Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the College Catalog and on the College of the Redwoods website.

Canvas Information

- Log into Canvas at My CR Portal
- For help logging in to Canvas and general tech help, visit Student Technical Support
- Once you're logged in to Canvas, you click on the Help icon on the left menu
- Canvas online orientation workshop: Canvas Student Orientation Course

Setting Your Preferred Name and Pronouns in Canvas

Students have the ability to display personal pronouns and an alternate first name in Canvas. Students may change their pronouns on their own in Canvas (Account :: Settings :: Edit Settings). To request a change to your preferred list name, contact Admissions & Records. Your Preferred Name will only be listed in Canvas; this does not change your legal name in our records. See the Student Information Update Form (pdf).

Emergency Procedures / Everbridge

College of the Redwoods has implemented an emergency alert system called Everbridge. In the event of an emergency on campus you will receive an alert through your personal email and/or phones. Registration is not necessary in order to receive emergency alerts. Check to make sure your contact information is up-to-date by logging into WebAdvisor https://webadvisor.redwoods.edu and selecting 'Students' then 'Academic Profile' then 'Current Information Update.'

Please contact Public Safety at 707-476-4112 or security@redwoods.edu if you have any questions. For more information see the Redwoods Public Safety Page.

In an emergency that requires an evacuation of the building anywhere in the District:
- Be aware of all marked exits from your area and building
- Once outside, move to the nearest evacuation point outside your building
- Keep streets and walkways clear for emergency vehicles and personnel

Do not leave campus, unless it has been deemed safe by the campus authorities.

Eureka Campus Emergency Procedures

Please review the campus emergency map for evacuation sites, including the closest site to this classroom (posted by the exit of each room). For more information on Public Safety go to the Redwoods Public Safety Page It is the responsibility of College of the Redwoods to protect life and property from the effects of emergency situations within its own jurisdiction.

In the event of an emergency:

1. Evaluate the impact the emergency has on your activity/operation and take appropriate action.
2. Dial 911, to notify local agency support such as law enforcement or fire services.
3. Notify Public Safety 707-476-4111 and inform them of the situation, with as much relevant information as possible.
4. Public Safety shall relay threat information, warnings, and alerts through the Everbridge emergency alert system, Public address system, and when possible, updates on the college website, to ensure the school community is notified.
5. Follow established procedures for the specific emergency as outlined in the College of the Redwoods Emergency Procedure Booklet, (evacuation to a safe zone, shelter in place, lockdown, assist others if possible, cooperate with First Responders, etc.).
6. If safe to do so, notify key administrators, departments, and personnel.
7. Do not leave campus, unless it is necessary to preserve life and/or has been deemed safe by the person in command.

Student Support Services
The following online resources are available to support your success as a student:
- CR-Online (Comprehensive information for online students)
- Library Articles & Databases

- [Canvas help and tutorials](#)
- [Online Student Handbook](#)

[Counseling](#) offers assistance to students in need of professional counseling services such as crisis counseling.

Learning Resource Center includes the following resources for students

- [Academic Support Center](#) for instructional support, tutoring, learning resources, and proctored exams. Includes the Math Lab & Drop-in Writing Center
- [Library Services](#) to promote information literacy and provide organized information resources.
- [Multicultural & Diversity Center](#)

Special programs are also available for eligible students include

- [Extended Opportunity Programs & Services (EOPS)](#) provides services to eligible income disadvantaged students including: textbook award, career academic and personal counseling, school supplies, transportation assistance, tutoring, laptop, calculator and textbook loans, priority registration, graduation cap and gown, workshops, and more!
- The TRiO Student Success Program provides eligible students with a variety of services including trips to 4-year universities, career assessments, and peer mentoring. Students can apply for the program in [Eureka](#) or in [Del Norte](#)
- The [Veteran's Resource Center](#) supports and facilitates academic success for Active Duty Military, Veterans and Dependents attending CR through relational advising, mentorship, transitional assistance, and coordination of military and Veteran-specific resources.
- Klamath-Trinity students can contact the CR KT Office for specific information about student support services at 530-625-4821

Evaluation & Grading Policy

Student Contribution
Students are expected to spend time reading assigned material, answering chapter review questions, and studying for tests as necessary outside of normal class time. Attendance is critical in this course. Lectures may contain material not included in the textbook and students will be responsible for this material. The student will be expected to participate in all lectures, preferably as "interactive aides", but minimally as "active listeners". Each student is responsible for all material presented in this course regardless of class attendance. Students will be expected to adhere to the College of the Redwoods Student Code of Conduct and Discipline at all times.

Course Participation Policy
In every occupation participation is critical and this course is no different. Everyone has a task and something to contribute, we all depend on each other in order to realize our goals. In order to fully participate, students must be present and actively engaged in whatever the current task is. Punctuality is an important part of participation. If someone is late for work, it not only reflects poorly on their character, it puts the entire process behind schedule. Absences may be excused for medical reasons and some family related reasons such as a death in the immediate family. Any student seeking an excused absence should be able to provide proof of their reason for absence prior to the absence being excused.

Attendance is required: 10 points for each class attended (0 points if class is missed, 5 points if you are late or leave early)**

Assignments/Exams
Assignments and exams are to be completed as assigned. Assignments and exams are posted in Canvas with a description of how to complete the assignments and when it is due. If there are questions about the requirements for any assignment or exam, it is the student's responsibility to seek clarification from the instructor. There will be no substitutions for

assigned course work, as a general rule.

Late and/or Missing Work
By default, all late and missing work is the responsibility of the student and should be completed as assigned. The instructor assumes no obligation to offer make-up work or any type of alternative arrangement for late and/or missing assignments.

Missed Assignments/Exams
Some assignments and exams can only be completed if students are in class. If a student must miss a class, for any reason, their ability to make up the missed assignment is up to the discretion of the instructor. If a student must miss an exam, it is their responsibility to notify the instructor PRIOR to the scheduled exam. A student's ability to make up a missed exam is mostly dependent on how much notice the instructor is given. The process for makeup exams entails students making an appointment with the Testing Center at the Academic Support Center in the Learning Resource Building on campus. The exam must be made up prior to the post exam review that follows the original exam date. Typically, an exam is scheduled on a certain day and the following week the exam is returned to students and a post exam review is held in class. Therefore, typically, a makeup exam must be completed either before, or within a week of, the original exam date.

Drug and Alcohol Policy
Being under the influence of drugs or alcohol during class is unacceptable and is a violation of the student code of conduct. Any student suspected of being under the influence of drugs or alcohol will be asked to leave. Further action may include referral to the Chief Student Services Officer and/or removal from the program.

CT 33 Course Evaluation
Grades will be earned as follows:
Attendance - 10 points each/15 classes, 150 points possible
Chapter Quizzes/worksheets - 10 points each, 140 points possible
Midterm - 100 points
Final - 100 points

TOTAL - 490 points possible

A   90-100%
B   80-89%
C   70-79%
D   60-69%
F   59% and below

Course Calendar

Week 0 Aug. 27	Welcome to class/ Course Introduction Review introductory material and complete Canvas assignment
Week 1 Sept. 3	Introduction to Photovoltaic Systems Read chapter 1 complete quiz on Canvas
Week 2 Sept. 10	Solar Radiation Read chapter 2 complete quiz on Canvas
Week 3 Sept. 17	Site Surveys and Preplanning Read chapter 3 complete site survey worksheet and analysis

Week 4 Sept. 24	System Components and Configurations Read chapter 4 complete quiz on Canvas
Week 5 Oct. 1	Cells, Modules, and Arrays Read chapter 5 complete quiz on Canvas
Week 6 Oct. 8	Batteries Read chapter 6 complete quiz on Canvas and turn in battery worksheet
Week 7 Oct. 15	Mid Term Exam Review Discussions and review of Mid Term material
Week 8 Oct. 22	In-class Midterm Exam
Week 9 Oct. 29	Charge Controllers Read chapter 7 complete quiz on Canvas
Week 10 Nov. 5	Inverters Read chapter 8 complete quiz on Canvas
Week 11 Nov. 12	System Sizing Read chapter 9 complete quiz on Canvas
Week 12 Nov. 19	Mechanical Integration Read chapter 10 complete quiz on Canvas
Week 13 Nov. 26	Fall Break – No Classes
Week 14 Dec. 3	Electrical Integration Read chapter 11 complete quiz on Canvas
Week 15 Dec. 10	Final Exam Review Discussions and review of Final material
Dec. 17	Final Exam 6:05p-8:05p