

ENME 701 COURSE SYLLABUS, FALL, 2019

SUSTAINABLE ENERGY PRODUCTION AND UTILIZATION

March 28, 2019

Instructor

Dr. Reinhard Radermacher (x55286,
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Assistant: TBD

Course Objectives:

- Understanding of technologies for sustainable energy production, conversion and utilization
- Understanding of limitations and opportunities
- Gain experience in challenges and opportunities in designing sustainable energy systems
- Develop your own vision for a future sustainable energy scenario and for the path that gets us there.
- Apply your knowledge to the design of a net-zero carbon emission UMD campus at College Park.

Time & Place: TBD

Office Hours Tu 3:00pm – 3:45pm

Textbooks

David J.C. MacKay, Sustainable Energy – without the hot air. Free on Internet

Tester, et al., Sustainable Energy: Choosing Among Options, 2nd Edition,

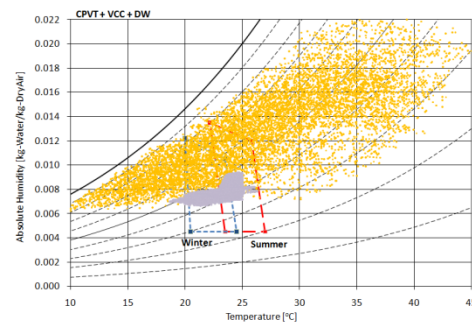
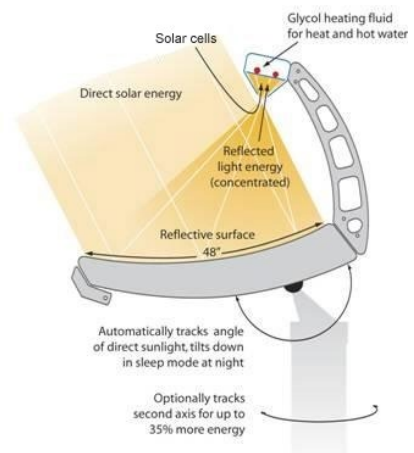
ISBN 9780262017473, MIT Press, 2012

Recommended Texts (latest editions):

- Duffie and Beckman, “Solar Engineering of Thermal Process”, ISBN 0-471-69867-9, John Wiley and Sons INC.,
- Tiwari and Ghosal, “Renewable Energy Resources”, ISBN 1-84265-125-0, Alpha Science International Ltd.,
- UN IPCC Reports, Free on Internet

Course Outline

- Impact of Energy Conversion on Environment
- Energy Systems Overview – History and Current Status



Courtesy of The National Renewable Energy Laboratory (NREL)

- Energy and Economics
- Solar Energy
 - Physics, Solar Angles
 - Technology and Application: Solar Thermal Systems
 - Technology and Application: Solar PV Systems
- Wind-turbines
 - Physics
 - Applications
- Hydro Power
- Energy Storage Options
- Design Discussions for Friendsville
- Net-zero-energy House Design for US Regions
- Ocean Thermal Energy Conversion (OTEC)
- Energy Roadmap for net-zero emission campus.

The above topics will be taught and/or developed by student groups and be graded based on quizzes and homework projects presented by students in class

- Student Presentations (Final selection of topics will be made jointly in class)
 - Other Renewable Energy Sources
 - Ocean Energy (other than OTEC)
 - Bio-fuels
 - Nuclear (optional)
 - Energy Issues and Opportunities in Storage, Transportation, Distribution

Grading:

Quizzes (30%)

Presentations and Projects (40%)

Capstone Project (30%)

Due Dates:

The course has no final exams. Each assignment including report and presentation must be submitted through email to the instructor and uploaded to Canvas no later than 12 noon on the due date.

Expectations for Students:

Each student is expected to be actively involved in group work including writing reports and presentations. A peer evaluation may be conducted to determine the participation and contribution of each member to the group work. Peer evaluation results will be applied to each student's grade.

Code of Academic Integrity

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit

<http://www.studenthonorcouncil.umd.edu/whatis.html>.

Method for Communication with Students outside the Classroom

Any cancellation of class, change of classroom or other timely announcement will be provided to students through email as early as possible.

Emergency Protocol

Classes will be cancelled in case of an emergency that closes the University. If the emergency lasts for an extended period of time, means of continuing / completion the course will be sent to students via email.

Copyright Notice

Course material may be under copyright protection. Students may not copy and distribute such materials except for personal use and with the instructor's permission.

Students with Disabilities

The course will provide appropriate accommodations for students with disabilities. To receive the accommodations, students must first have their disabilities documented by the [Disability Support Service Office](#). The office then prepares an Accommodation Letter for course instructors regarding needed accommodations. Students are responsible for presenting this letter to their instructors by the end of the drop/add period.