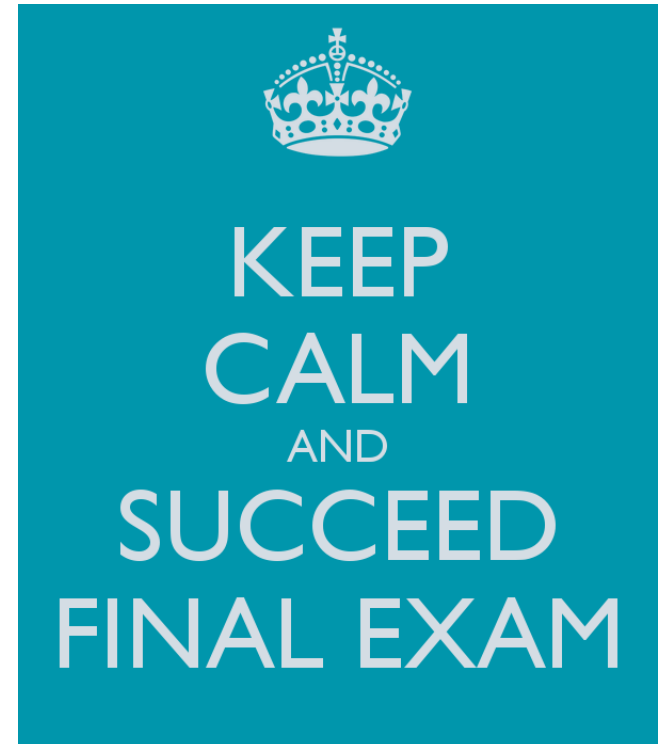


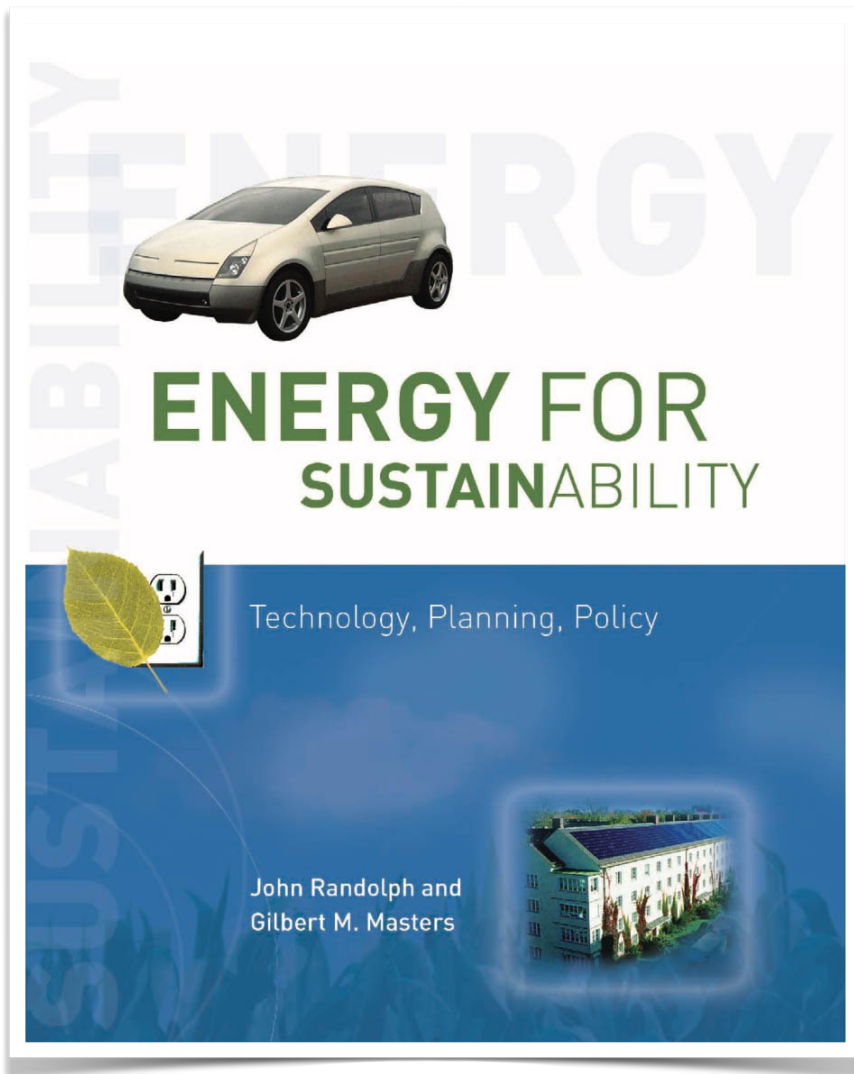
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ENVS 119 - Energy & the Environment

18 - Final Exam Study Guide



FINAL - TEXTBOOK/READING NOTES



Randolph and Master

Chap 12, 7, 11, 5, 14, 16, 17

Look for specific sections in class syllabus.

All other readings assigned.

LECTURE #12 - Wind energy

- How is the potential wind power output calculated for a specific site and turbine? (Formula)
- Be able to define “renewable energy”, “Renewable Portfolio Standard (RPS)”, “Renewable Fuels standard (RFS)” (see Randolph and Master pp645-646 Chap.16)
- How can the social gap in renewable energy be overcome? Wind/Solar
- Define « intermittent » for wind energy. Why is it a problem?
- Primary source of power for wind energy?
- How much of CA electricity is likely to be produced from Wind by 2050?

LECTURE #13 and #14 - Solar Energy

- Explain passive design for buildings. insolation, insulation, solar path, solar collector.
- How do photovoltaics panels generate electricity? Define: Solar Photovoltaic panel (PV) vs. Solar Thermal power plants.
- Understand efficiency factor, what is the normal efficiency from PV panels?
- Understand energy intermittency of Solar and why energy storage is needed. Different technologies of electricity storage?
- How much of CA electricity is likely to be produced from the Sun by 2050?

LECTURE #15 - Life Cycle Analysis

- What is EROI and how do you calculate it? See the Wind example.
- What is an LCA? Apply this to a light bulb study comparing classic incandescent to CFL.
- Why are a majority of renewable energy projects are now able to compete with fossil fuels on the market place, even without subsidies? (Hints: better EROI than fossil fuel).
- Define: Impact Category, Functional Unit, System Boundaries.
- Define: Initial Energy Investment (see EROI).

LECTURE #16- Biofuels and Biomass

- Define 1st, 2nd, 3rd Generation biofuels
- What are the options to produce a biofuel version of Diesel?
- What are the options to produce a biofuel version of Gasoline (ie: Ethanol)
- Main differences between Brazil and US Ethanol?
- Why are biofuels a serious option to consider when it comes to climate change policies? Why, so far, most of the outcomes have been minimal?
- What is the primary energy source of most of current liquid fuels (Gasoline, Diesel, jet fuel...) - Response: petroleum

LECTURE #17 - Energy Efficiency/Conservation

- Who is Lovins? Define the concept of « Negawatt »
- Calculation: Be able to calculate the cost of megawatts from \$saved and \$invested in energy saving devices.
- Know the average cost per kWh (residential rate) in CA (\$0.16) - bulk market price = \$0.12
- What motivates people to conserve energy? (according to Dietz)
- How governments « force » industry and consumers to adopt energy efficient devices (saving our air quality and lives at the same time)? Be able to discuss the Fridge case in US.

Final Exam ENVIS/ENGR 119

1. All your reading notes, graded assignments and quizzes are authorized during the test (no slides copy, no textbook, no readings hard or soft copies)

**— — No internet access (other than Canvas) during exam — —
per SJSU academic policy, any student cheating will be reported to
academic council. Exam proctored with Respondus.**

2. 30 questions total
20 multiple choices (3 pts each),
5 short math problems (4 pts each),
5 quiz's/reading questions (4 pts each)

3. Bring a calculator (better than your smartphone that will trigger Respondus)