

Engaged Learning Group



Energy and Society:
The Costs and Benefits
of an Energy-
Dependent Civilization

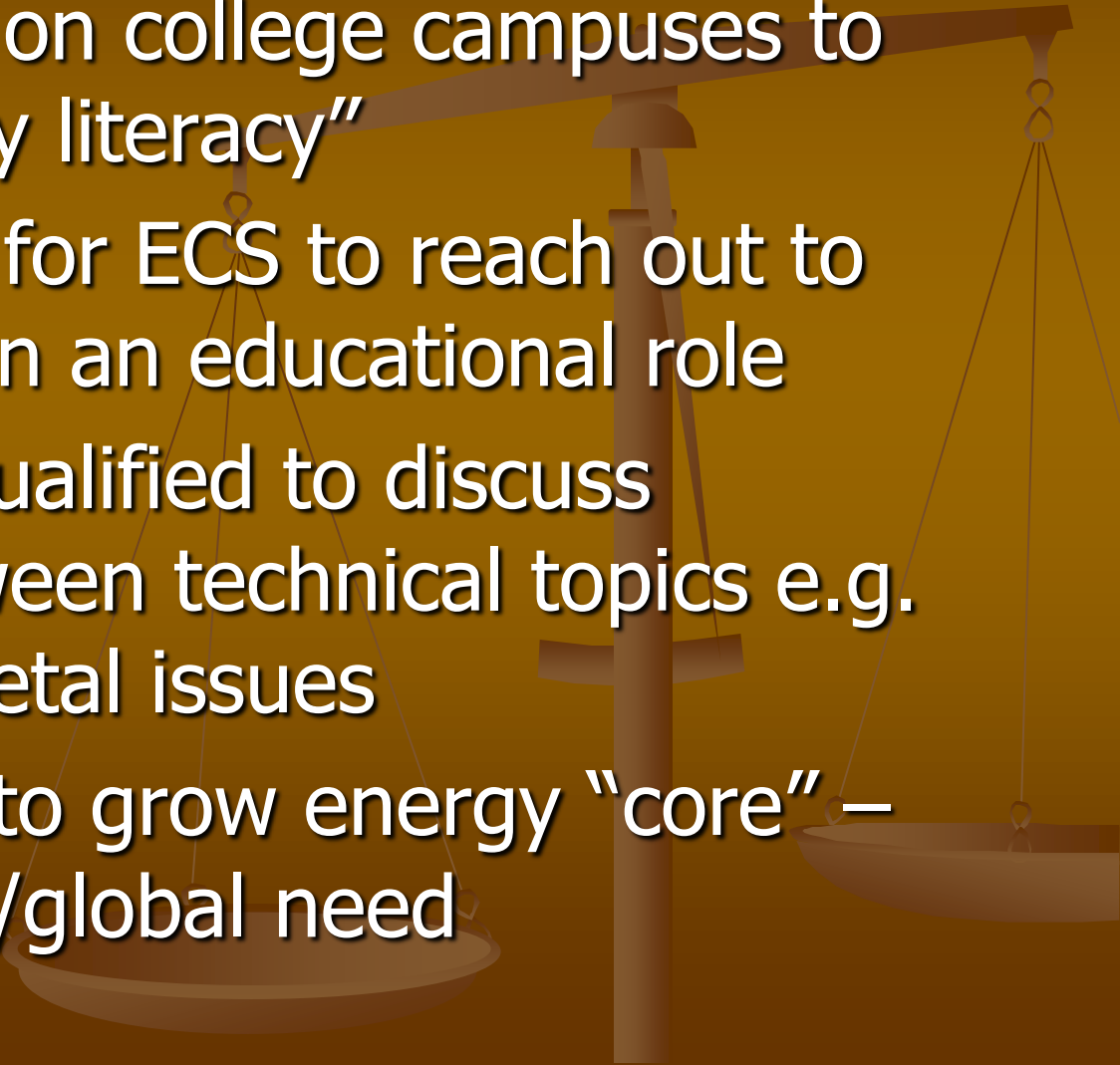


Background on ELGs

- SACS/QEP initiatives: ELGs and UG Research
- ELGs are:
 - Residential learning communities
 - Unique academic focus (carry credit)
 - For diverse student population (interdisciplinary ELG leadership)
 - 2-year duration
 - Designed to increased retention, foster academic success
 - Research-oriented



Why Should Engineering Help?

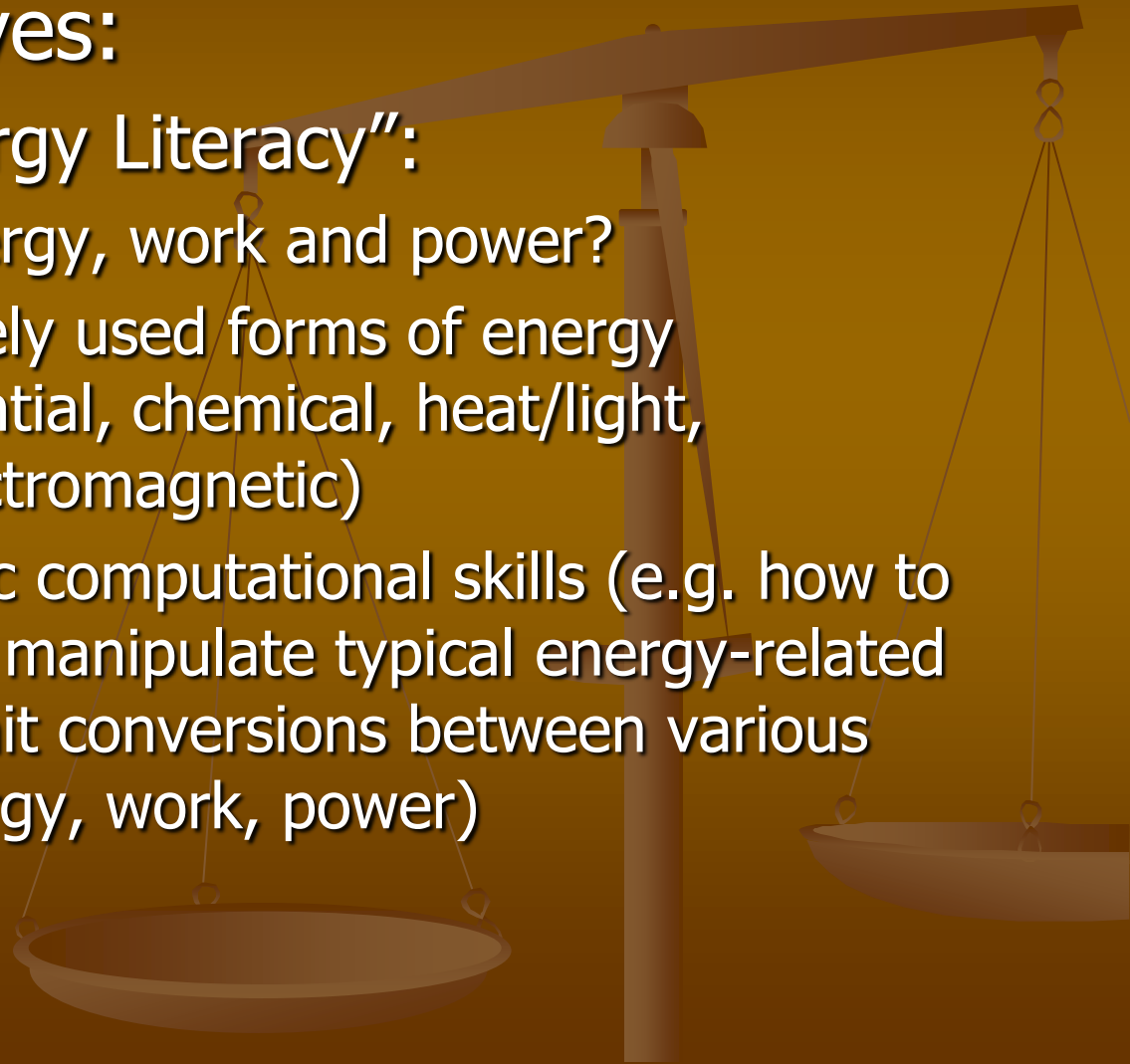
- There is a need on college campuses to focus on “energy literacy”
 - There is a need for ECS to reach out to rest of campus in an educational role
 - No one better qualified to discuss connection between technical topics e.g. energy and societal issues
 - ECE/ME aiming to grow energy “core” – address societal/global need
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Energy and Society ELG

■ Three Objectives:

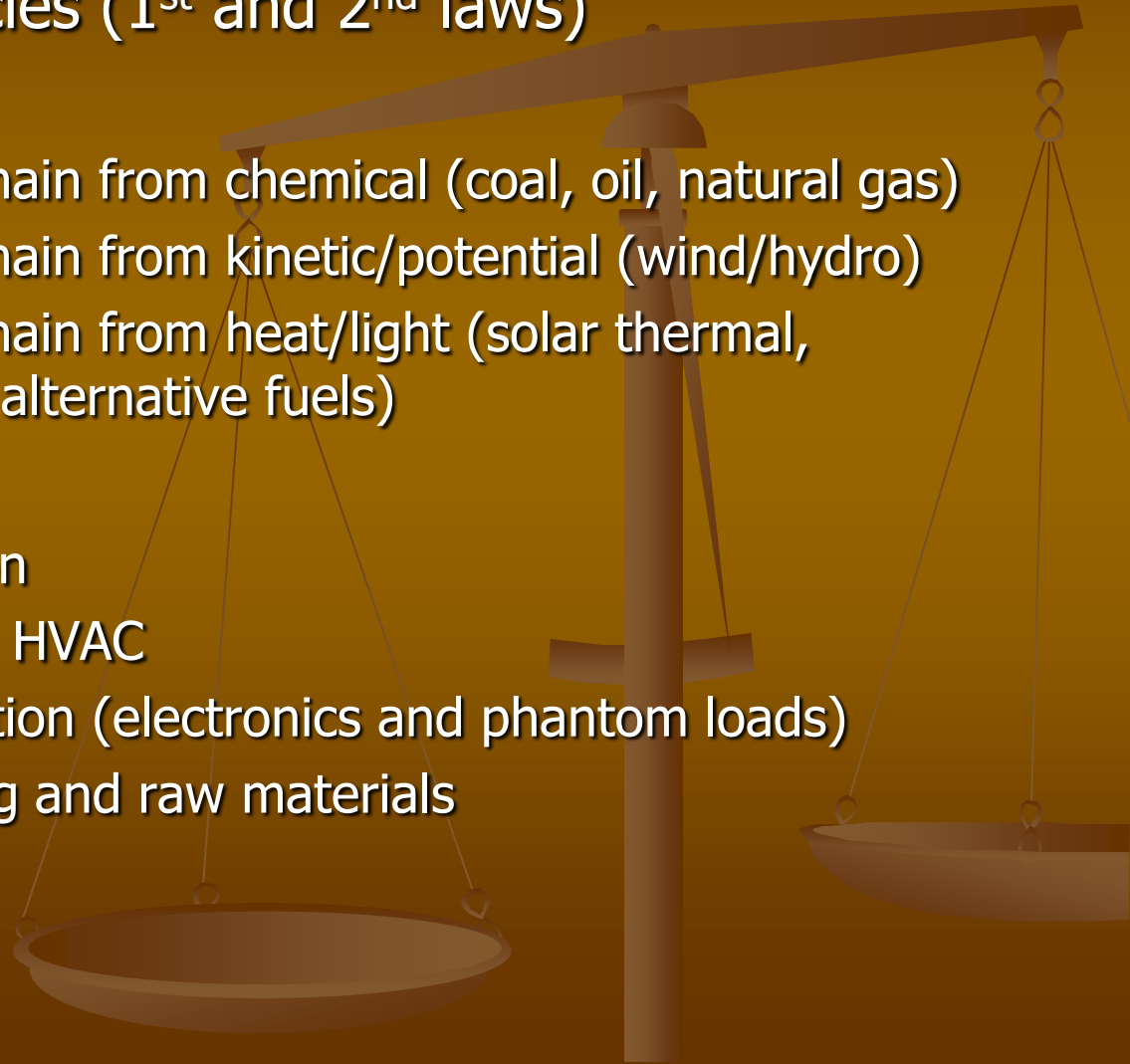
1.) Develop “Energy Literacy”:

- What are energy, work and power?
- Examine widely used forms of energy (kinetic/potential, chemical, heat/light, electrical/electromagnetic)
- Promote basic computational skills (e.g. how to interpret and manipulate typical energy-related equations, unit conversions between various forms of energy, work, power)



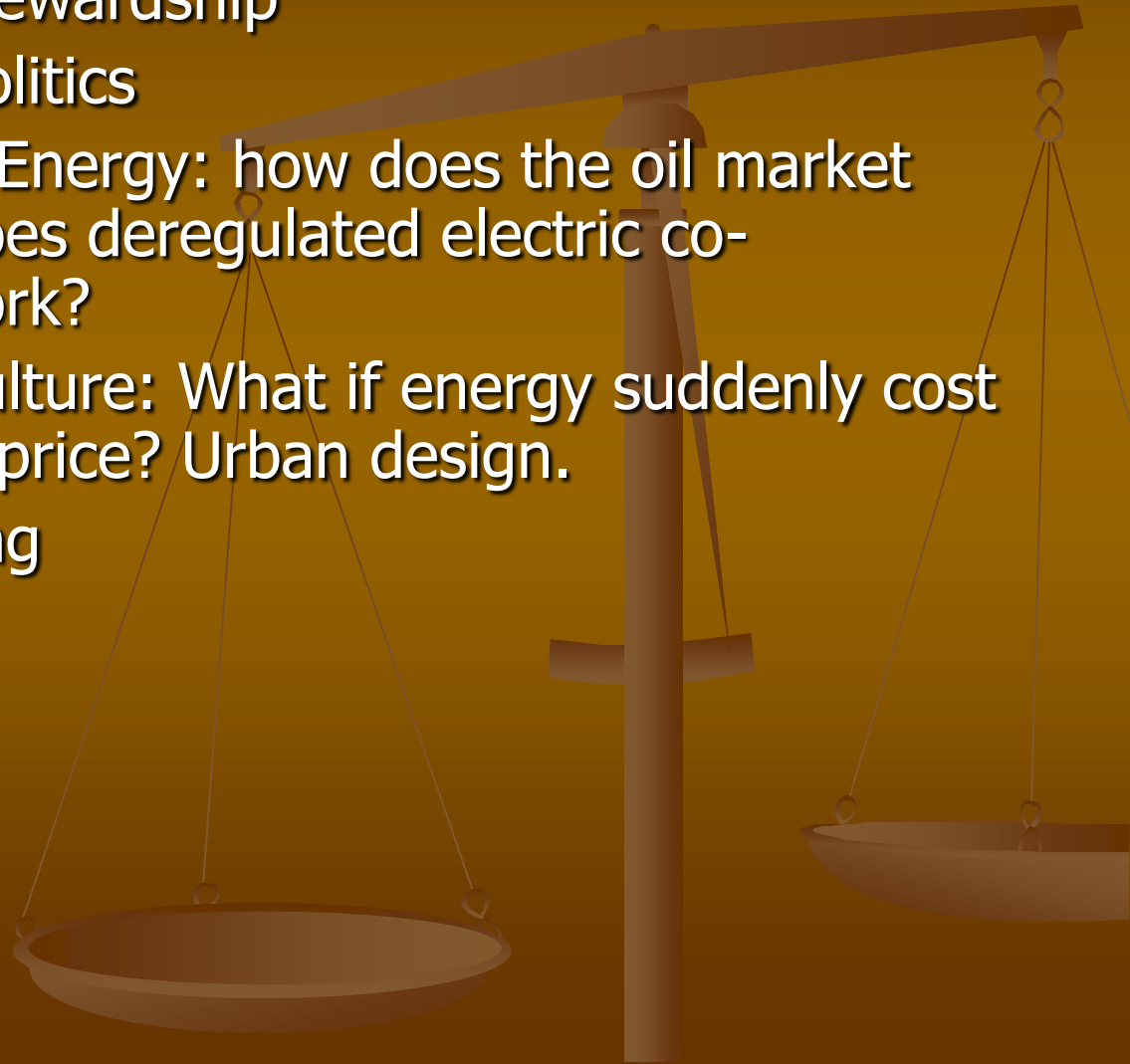
2.) Energy Production and Consumption

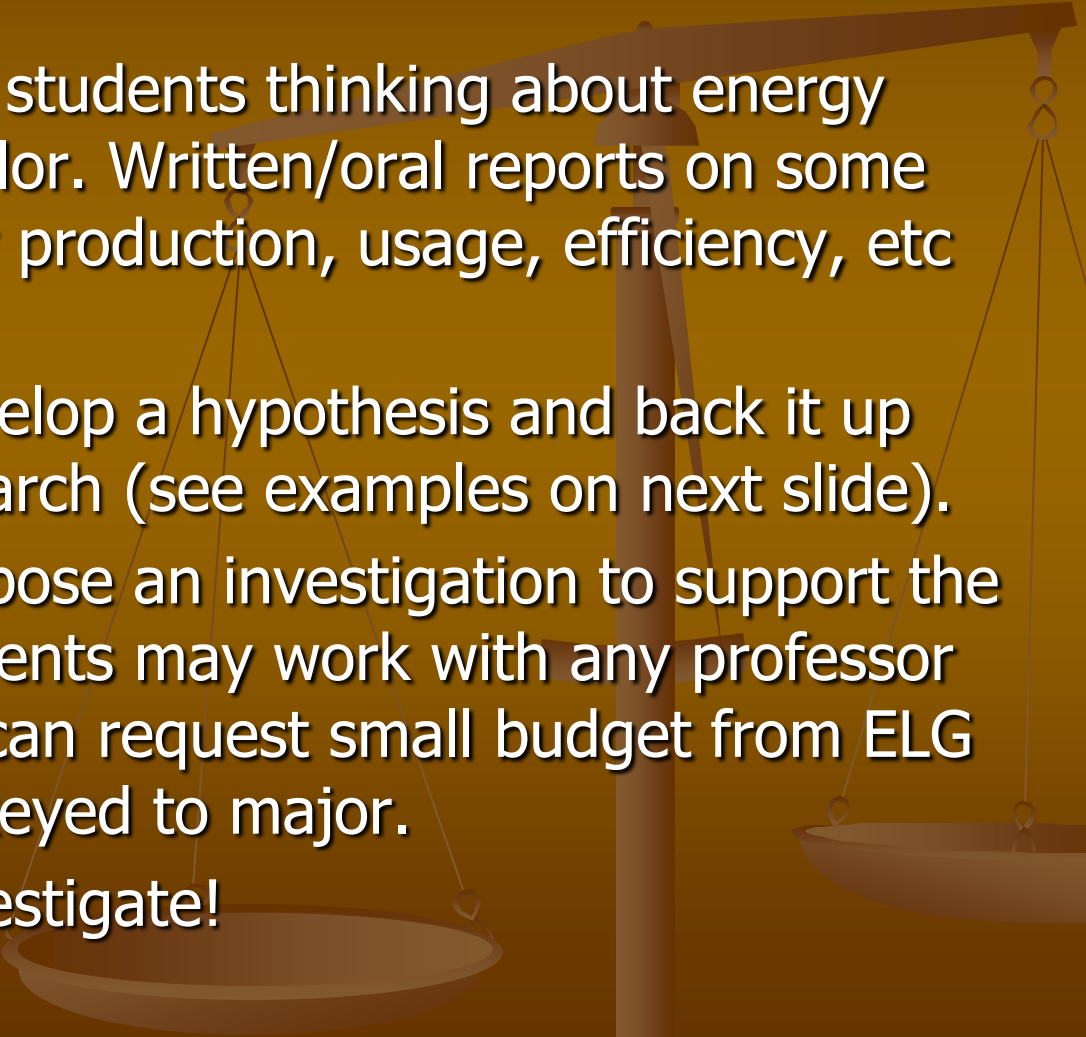
- Examine energy conversions and conversion chain efficiencies (1st and 2nd laws)
- Production:
 - Conversion chain from chemical (coal, oil, natural gas)
 - Conversion chain from kinetic/potential (wind/hydro)
 - Conversion chain from heat/light (solar thermal, photovoltaic, alternative fuels)
- Consumption:
 - Transportation
 - Buildings and HVAC
 - The e-civilization (electronics and phantom loads)
 - Manufacturing and raw materials
 - Agriculture



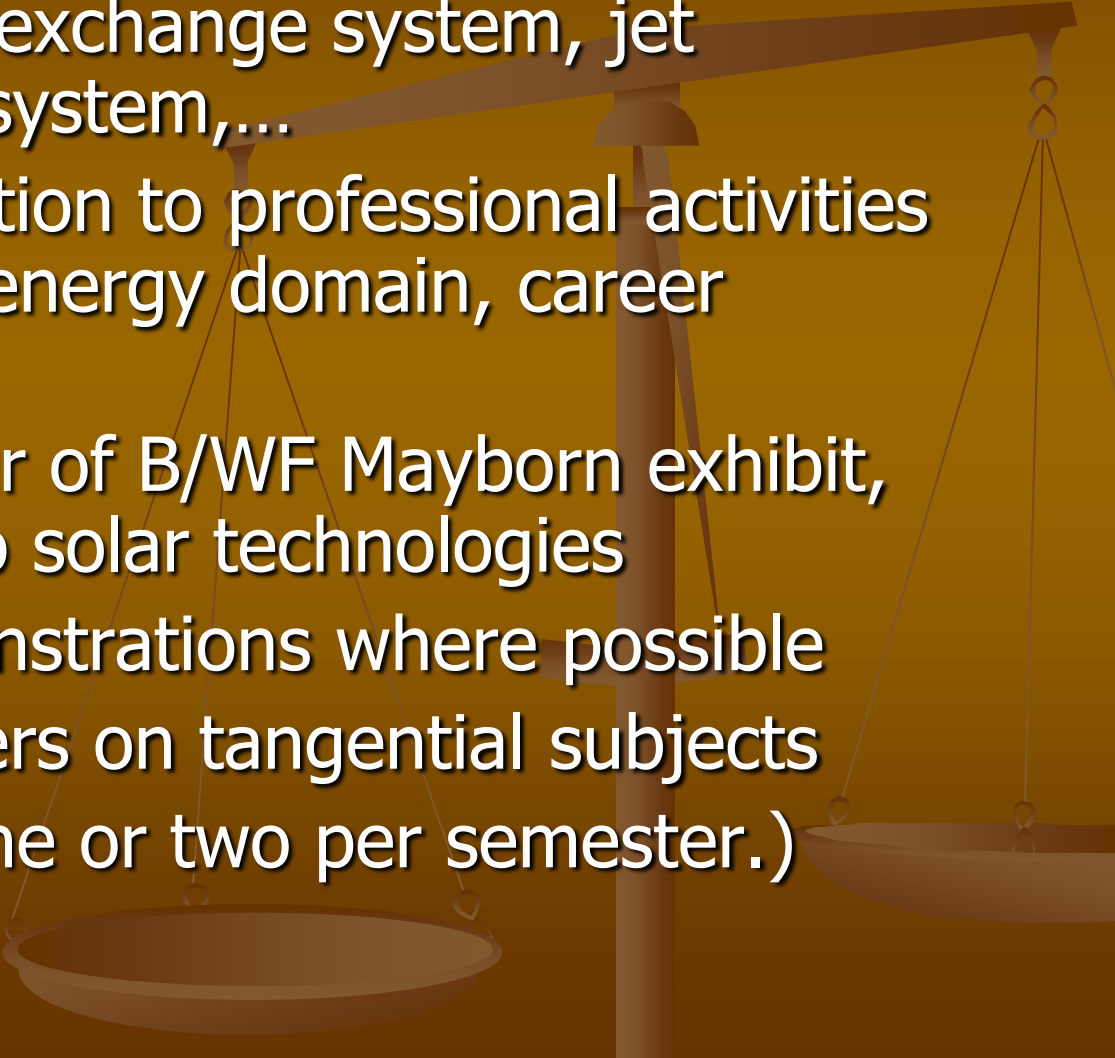
3.) The Energy-Dependent Civilization

- Environmental costs of energy production
- A matter of stewardship
- Energy and politics
- Economics of Energy: how does the oil market work? How does deregulated electric co-generation work?
- Energy and culture: What if energy suddenly cost 3x its current price? Urban design.
- Global warming

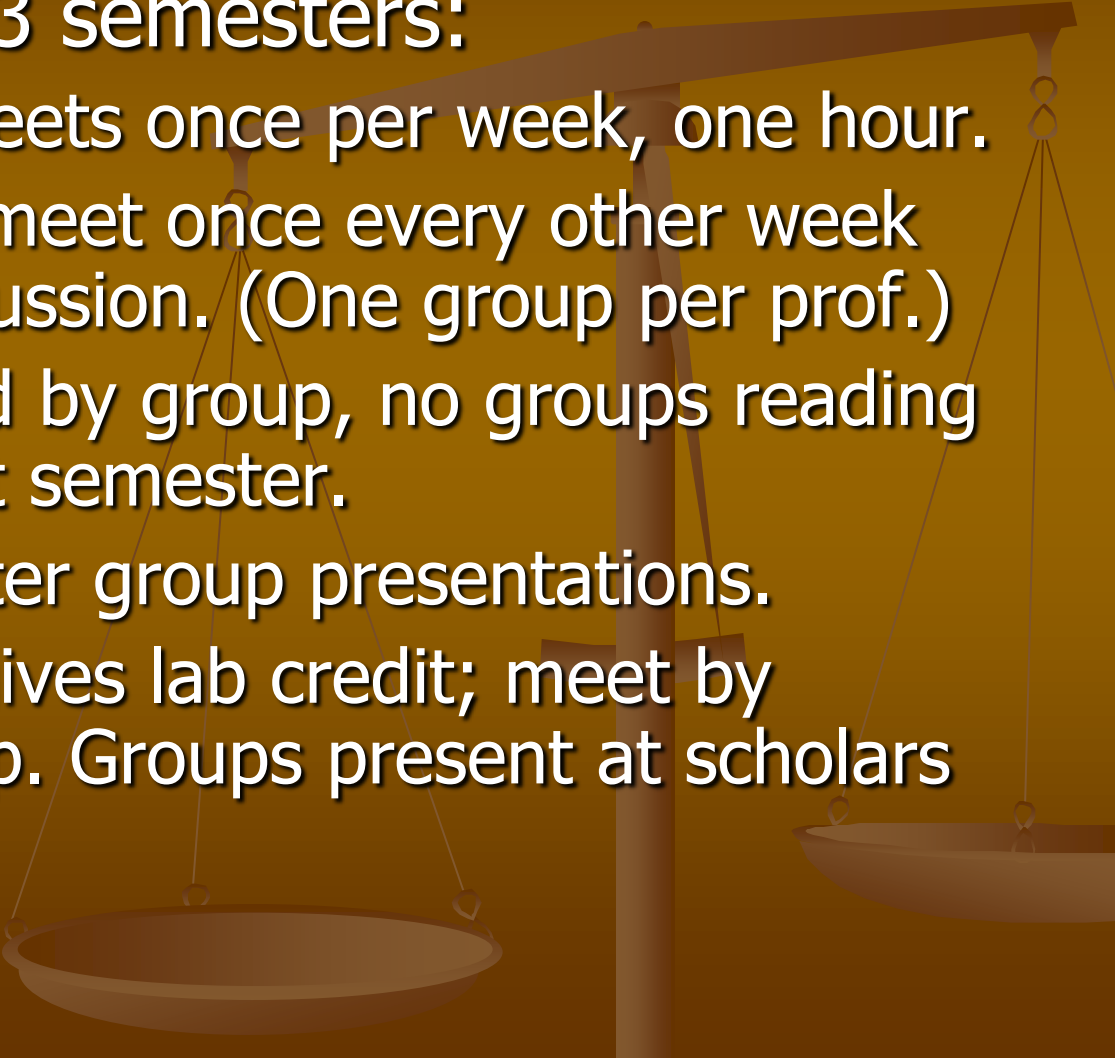


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- Research Theme: The campus as an alternative-energy and energy-efficiency laboratory
 - Semester 1: Get students thinking about energy resources at Baylor. Written/oral reports on some aspect of energy production, usage, efficiency, etc seen at Baylor.
 - Semester 2: Develop a hypothesis and back it up with library research (see examples on next slide).
 - Semester 3: Propose an investigation to support the hypothesis. Students may work with any professor on campus and can request small budget from ELG funds. Projects keyed to major.
 - Semester 4: Investigate!

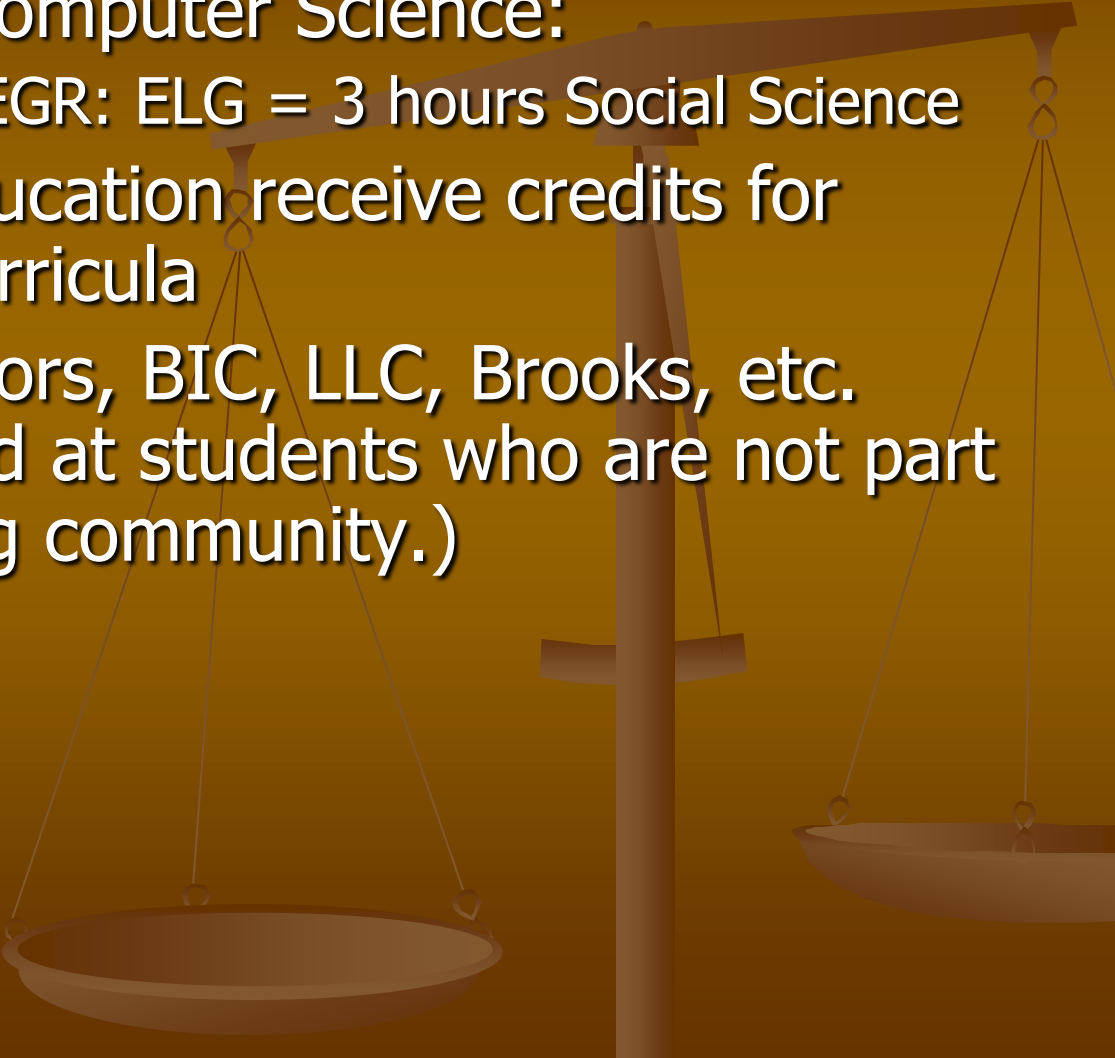
■ “Extras”

- Van Treuren: tour of fluid/thermal lab and demo of heat-exchange system, jet impingement system,...
 - Lehr: introduction to professional activities in alternative energy domain, career opportunities.
 - Gravagne: tour of B/WF Mayborn exhibit, introduction to solar technologies
 - In-class demonstrations where possible
 - Invited speakers on tangential subjects
 - Field trips. (One or two per semester.)
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Class structure

- 3 credits over 3 semesters:
 - Entire class meets once per week, one hour.
 - Small groups meet once every other week for group discussion. (One group per prof.)
 - Texts assigned by group, no groups reading same text that semester.
 - End-of-semester group presentations.
 - 4th semester gives lab credit; meet by research group. Groups present at scholars day.
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Academics

- Engineering and Computer Science:
 - B.S. CSI/ME/ECE/EGR: ELG = 3 hours Social Science
 - A&S, Business, Education receive credits for courses in their curricula
 - ELG closed to Honors, BIC, LLC, Brooks, etc. (ELG's are targeted at students who are not part of another learning community.)
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How Are We Doing So Far?

- 27 students
- From Nursing, Business, Education, Pre-Law, Pre-Med, Engineering, Theatre, Philosophy...
- Harder than we thought!
- “Non-technical” students afraid of numbers...
- ... BUT seeing and understanding big issues

