SYST 490 2012: Faculty & Industry Sponsor Evaluations
Congratulations!

• Overall, good “project proposal” briefings.
  – Communication skills – outstanding
  – Slide preparation – very good
  – Technical content and project planning – good, but problems with completeness, consistency, and logical/linear communication of ideas
    • Problem Statement must be derived from Context and Stakeholders Analysis
    • Mission Reqs must be derived from Context and Stakeholders Analysis
    • Design Alternatives must be derived from Context and Stakeholders Analysis
System Engineering is all about finding the *problems/faults* before the system is built and fielded,
so accept scores and comments in spirit of constructive criticism.
• Feedback from stakeholders, crowd-sourcing, focus groups, SME is critical to success

• System Engineers must be “thick-skinned”
Adversity breeds Success

GMU Senior Design Students
Moving Forward

• Take all lessons learned from 1st semester and apply to 2nd semester

• Remember ... this is the most challenging, yet most rewarding class you will ever take
<table>
<thead>
<tr>
<th>Project</th>
<th>Avg Total</th>
<th>Equiv Letter Grade</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bio-Diesel</td>
<td>3.98</td>
<td>C+</td>
<td>0.47</td>
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<tr>
<td>Campus Shuttle</td>
<td>3.81</td>
<td>C</td>
<td>0.57</td>
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<td>Grav Survey</td>
<td>3.72</td>
<td>C</td>
<td>0.46</td>
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<tr>
<td>CR/ANSP</td>
<td>3.71</td>
<td>C</td>
<td>0.45</td>
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<tr>
<td>Sports Anal</td>
<td>3.69</td>
<td>C</td>
<td>0.61</td>
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<td>UAS-LL</td>
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<tr>
<td>ROQA</td>
<td>3.44</td>
<td>D+</td>
<td>0.64</td>
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Note: High Standard Deviation indication confusion by audience
# OVERALL SCORE (5 max)

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Comments from Evaluators
UAS/LL

- Has potential to be a good project – needs a lot more work
- I do not see quantitative performance measures for reqs
- Design alternatives not clear
  - How does sensor performance come into picture
  - Did not discuss design alternatives AT ALL
- That is complex model team has proposed. Curious to see if team can handle this complex of a problem
  - How are design alternatives modeled? Which parameters in the model
- No prelim results shown!
  - Need to realistically scope simulation
  - What about Rare events?
  - Should have had some prelim results at this point in project
- No utility function?
- Weak Design of Experiment
- No Project Risk and Mitigation?
- Could not answer questions
- Graphics were unreadable
Regional Transportation

- Interesting and relevant problem, but team does not seem to have embraced the project
- “Calculated using that formula there” – what formula? where? How 10.7K commuter need switch
- Problem statement: list bullets (not para)
- Not including “frequency” is a serious limitation of study
- No discussion on riders mode choice model?
- Mission Reqs do not include quantitative performance measures and cannot be tested
- FFBD would be easier to follow that IDEF0
  – Needs much better explanation of functions
- Design alternatives are not explained well
  – Not clear what these are, needs more detail
  – What about other alternatives: car pooling with parking preference, on-demand taxi (e.g. uber), .... (Not sure this team is really thinking about the problem)
  – Why only these buses. What about other manufacturers
  – Are state schools obliged to purchase American made products (like U.S. government)
- Is simulation the right approach to this problem? Why?
- What is assumption of load factor on buses
- Why is demand not treated as a random variable

- Presentation is too shallow – needs more details
- Slides have no page numbers !@#$%
Bio-Diesel

• The project seems well scoped.
• Not sure about profit statements. Need to be more clear.
• What fraction of fuel is overall costs?
• Need statement describes the solution!
• Why not choose the most profitable crop
• Model and experimental design were not detailed enough – not sure this team knows how to model
• Stochastic models are not clearly defined. How are prob. Distribution defined, justified and used?
  — Specify how to do stochastic analysis
• Why is equipment choice not modeled. Did not understand answer in Q&A
• What weather/rain/temp distributions will be used? Why?
• Design of experiments OK but incomplete
• Good explanation of weight elicitation
• Estimated costs $10^{-1}$ accuracy reported with $10^{-4}$ precision
• Risk management is weak
Green Leasing

• Well briefed
• I gave [the project] a low grade, but the project has a lot of potential
• Good job!
• Is there a penalty for not making E.O. Discuss.
• Need better explanation on connection on how project helps [RECO] process
• Where is the bottleneck? How does this solution address the bottleneck?
• How are relocation costs measured
• Worried about impact of unknowable assumptions [for design alternatives
  – What about FAA pays for renovation?
• Assumption 5 does not seem realistic
• Its not clear the cost models on renovation and energy are realistic.
• Needs more precise data analysis
• AHP?
• Work needed on value hierarchy
• This project does not seem like a hard problem.
• Analysis is correct, but relatively simple compared to other projects
  – Did not discuss Sensitivity analysis
  – Did not discuss testing sensitivity of assumptions
• From FAA
  – Inventory numbers need to be updated
  – Location based cost data will need to be part of the model
CR/ANSP

- Problem well explained
- Handled questions well
- Why is current flight route not the optimal route
- There is tension between safety and efficiency
- How does metric reduce CO2
  - A metric monitors but does not result in change
- Reqs are not well stated. % are not stated. page 25 not OK
- I have no idea what the 10 designs are!
  - What are these alternatives?
  - Why not implement all alternatives
- GCD is not the “optimal route” Time * fuel burn → optimize on TIME
- Your project is to minimize time. Groundspeed = wind speed + true airspeed
- Not sure what the simulation shows
- Design of Experiment is not well described
  - DOE is unclear
- Value hierarchy needs more help
- No discussion of project risks
- Listen to question and understand, before answering
• Correctly identified capacity vs safety tradeoff
• Nice job briefing the slides, but presentation is disconnected
  – Briefing jumped around hard to follow
• Design alternatives not explained
  – Design alternatives?
  – Design alternatives ROT rules (pg 37) or prototype tools (page 33, 38)
• Problem statement is on page 29
  – The goal of the project should be before slide 18
  – Discrete event with \( \text{Prob} = 0 \)? Do you mean treat non-probabilistically?
• WHO IS USER OF THE TOOL
  – No reqs provided
• Confusion between Runway Incursions and Separation Violations (these are not the same)
  – This project is about spacing (i.e. separation). Everything else is just noise
• Reqs not complete. What is XX, YY, ...
• How is data collected GPS, radar, ...
• Are you simulating collisions, wake vortex encounters, or separation violations
• Value hierarchy should not include cost
• Sim model needs a detailed technical review. LTI & IAT as input pdf.
• ROT Bi-modal explanation not correct
• Utility function not emphasized
  – Weights not discussed
• Prelim results not shown
• No discussion of rare events
Sports Analytics

- Interesting problem
- Sponsor seems very interested
- Based on Q&A, project may be better than presentation
- Impressive project, but description not clear
- What are constraints from NCAA? How are these modeled? Are they modeled?
- Opening slides disorganized
- Problem Statement unclear. Who uses decision support tool, when where, what used for?
- Consider problem statement “coaches need analysis to guide recruiting and training” You can solve this problem with the tool proposed
- Where does data come from
  - Can this data be automatically captured?
- What are the design alternatives?
  - How were design alternatives derived?
- Analysis is not an Analysis of Alternatives (AoA)
- It does not take 6 hours to analyze the video data. What analysis are you doing that it takes that long.
- While the Markov Chain is interesting, not clear what are results or how used?
- Give examples on how coach would use results. Be specific.
- A lot of confusion about project was answered in the Q&A. Fix the slides to include.
- How is variation in opponents play accounted for? What about tactical changes?
- Project is behind schedule. What is plan to catch-up?
Grav Survey

• Interesting background information.
• Easy to understand gap
• Why do distributions charts not have axes labeled?
  – PDF graphs were confusing
• Do not understand what the distributions have to do with the design alternatives
• Design alternatives are vague? What are they?
• You need to get more data for your distributions
• How does simulation answer sponsor questions
• Distributions relating to weather – should Alaska be in same group as others?
• Need weights from stakeholders. How will you get them?
• Not clear how analysis plan will get you to your goals
  – Alternatives are very vague
• Analysis plan does not seem to be thought out too well. Needs more work.
• DoE justification not clear.
• Explain how Monte Carlo will be run.
• Did not answer questions in Q&A well
• This project needs to shape up. Not too much work has been done
Looking forward to a great 2\textsuperscript{nd} semester