

Hello, my name is Sean Gordon, I am a third year engineering student at ISU, and I would like to bring attention to the implementation of assignments in many of the engineering classes offered.

Improvements to these aspects of classes will allow an accelerated curriculum, giving ISU the edge over other engineering universities.

This proposal details the plan to reform said classes by outlining:

- The current problem.
- Objectives of the project.
- The solution proposed.
- The methods to be used.
- And their costs of implementation.
- Followed by the project benefits.

Current Situation

- To begin, the teaching ideal I have found most widely accepted is to transfer the largest amount of information in the smallest amount of time, preferably with the sanity of everyone involved still intact.
- However, the engineering department at ISU seems to have drifted away from that.
- The problem lies with homework and laboratory assignments and their
 - Lack of ties to the main course objective,
 - Lazy recycling and busy work,
 - Imprecise instructions and reliance on missing groundwork.
- To begin a semester, a class will outline the end goal.
- This serves as a point of reference when completing assignments.
- Important for a student to get a full understanding of material and its relations.
- Milestones easy to forget in whirlwind of semester.
- From the inside as a student, it's difficult to tell where you are in relation to goal.
- Disorienting, leaving no clear direction or sense of progress.
- A second issue is that many departments are prone to lazy recycling and busy work.
- While it is of course impractical to rewrite class material every year, information should at least be updated regularly.
- For example, using a 15 year old graph may be fine in a geology class, but one concerning state of the art transistor sizes is likely obsolete.
- Assignments are not exempt either, with many filled with poorly disguised busy work.

- Finally, the crux of the problem lies in vague instructions, withheld information, and lengthy jargon.
- These result in wasted time, frustration, and loss of goodwill, common themes when conversing with engineering students about their current semester.
- Compounding that, a sizeable chunk of difficulty can be attributed to lack of coverage of the base material.
- This can be seen in many ComS courses, where a class often assigns a project involving some non-trivial functionality, such as server ↔ client interaction, without any coverage of the material.
- Much of this malpractice appears to be a misguided attempt to artificially increase the class difficulty, and in turn its perceived validity, while another large chunk is just due to laziness.

Solution

- Solving the defined issues will require an update to the existing homework for each class, and a change of mindset to ensure that the problem does not reappear.
- This project will be split into several steps to be replicated for each class.

Week 1: Refresh Milestones

- The course professor(s) will, starting from the prerequisites and ending at the end goal, break the stretch into small, distinct milestones.
- This puts the class into perspective, giving clear bases for assignments.

Week 2: Link Assignments to Milestones

- The professor(s) and any TAs of the course will take the created course milestones and decide where homework or laboratory assignments will be necessary.
- There should only be an assignment where one would positively impact student understanding of the material.

Weeks 3 - 4: Create Assignment Outlines

- The professor(s) and any TAs of the course will use the created course milestones and their links to assignments to build outlines.
- These assignments should direct student learning in the right direction, not acting as the driving force of it.

Weeks 5 - 8: Build Assignments

- The professor(s) and any TAs will now use the previous weeks' work to build the assignments.
- Emphasis should be placed on clear, concise writing.
- Jargon should be used sparingly to acclimate students to the field, not as a wall of alien text to increase difficulty.

Finally,

Weeks 8 - 10: Refine Assignments

- The professor(s) and any TAs will take the created assignments and refine them further.
- Each assignment should be inspected by multiple different people to ensure it meets standards and is on pace with the milestones.

Total maximum time cost is estimated at 400 man-hours.

With a calculated wage of close to ~\$60/hr, this results in ~\$23,000 per class.

Benefits

These changes will bring a considerable increase to course effectiveness:

- Lowering student frustration will keep engagement high.
- Student efforts will be guided toward the end goal much more directly.

Course throughput will be increased:

- With more efficient coursework, classes can be accelerated, fitting the same curriculum as before in a smaller time frame.
- Remaining time can be spent on review, or even an increased curriculum length.

Course reputation will also grow:

- A more effective course will reflect positively with student opinion,
- And with employers when their new employees have a better grasp of the taught concepts.

Conclusion

While the engineering department at ISU is esteemed for good reason, it is not without its problems.

These improvements to engineering course assignments will greatly improve the state of the engineering department, further growing ISU's reputation as a respected engineering university.

For more information about the proposed changes, please read the full proposal, or contact me at SeanGordonkh@gmail.com.

Thank you for your time!