

# Healthcare Systems Engineering Projects (ISE 474 and ISE 475)

Fall 2017

## Instructors' Information

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## What Will I Be Doing in the Project Courses?

We are glad you asked! You will be solving real-world problems in the healthcare industry, using your background, experience, and any of the tools you learned through the HSE program that are appropriate for the problem at hand.

A fair warning: real-world problems, especially in healthcare, are messy, unstructured, and not the beautiful textbook examples that might solve to round numbers. A significant amount of your effort will go into figuring out what the problem is in the first place! You will almost certainly feel one of the following at one point or another during the project:

- dismayed at how could this possible be going on
- frustrated that you have to wait for what feels like forever to get all the pieces of the puzzle
- overwhelmed by how much there seems to be left to do, even after you seem to have been working on it in what feels like forever
- elated with how friendly the staff and colleagues you are working with are
- inspired by the changes you are foreseeing and the impact you will have on the people you work with
- happy that it is finally over

Not to worry – these are all expected, and they are part of what happens in this type of project. If the problems were simple, they would have already been solved (and they would not be interesting). Our hope is that through this project, you will also find enjoyment and feel rewarded having gone through the process of taking a big, messy problem, breaking it down into pieces, and systematically setting to solve it. Without any doubt, you will uncover things that have not been known to the people dealing with the problem every day, you will make connections and you will learn a lot.

## No, Really, What Will I Be Actually Doing?

Well, that depends on your project assignment. You might be working with a hospital, or a medical device manufacturer, or a blood center, or an outpatient clinic, or other healthcare setting. You might be working on a process improvement project, or a more analytical project. You might be building engineering models, or running kaizen events, or doing data mining; interviewing subject matter experts (we call them SMEs) or digging through scholarly articles to find the latest research on a topic. The

bottom line is that you will be in charge of delivering your project to completion, solving the problem at hand with whatever tools are necessary or apply (of course, within legal, ethical and compliance boundaries). You will likely spend a lot of time on your project course – we usually estimate at least ten hours of work per week, but this may vary over the duration of the project (for example, you might spend more than this at the beginning of the project). There will be a lot of assignments and opportunities to practice your communication, analytical and critical thinking skills, from short memos, to presentations, project charter, progress checkpoints and final deliverables.

A note to working professionals: we realize that you have a lot of experience doing similar projects in your professional career. We encourage you to bring that experience into the project and welcome your thoughts and suggestions; however, we advise you to follow the process outlined by us. This is meant to provide you exposure to another way of running projects, which may be similar or somewhat different from what you have encountered before.

### What Will I Get Out of the Project Experience?

For one, you will be gaining very valuable practical experience. By the end of it, you would have gone through the whole project process, from scoping and definition, to analysis, to recommendations. Depending on the case, you may have had an opportunity to prototype or run a pilot of your proposed solutions. Regardless, you will have worked through building a quality team, identifying and quantifying problems, prioritizing initiatives, validating assumptions, developing metrics and using a data-driven process to make decisions and improve the state of affairs, and communicating what are often very technical concepts and results to a non-technical audience, both orally and in writing. All these skills and experiences are immediately transferable to your professional life effective immediately.

### What Should I Make Sure I Know Before Starting a Project?

You should have completed the equivalent of ISE 470 (Introduction to Healthcare Systems), ISE 471 (Quality and Process Improvement in Healthcare) at the very least. Of course, you may have experience in the industry, in which case, that will be taken into account. In addition, if you are looking to build skills and knowledge in a specific area, you are expected to have some background in that area (for example, you might need to have some knowledge of healthcare finance, before you can work on a project that would teach you more about physician compensation in the age of the Affordable Care Act).

### What about Textbooks and Resources?

There is no textbook for the course. Whenever applicable, materials will be shared for readings or workshops. In general, the project is an individualized experience – you may work along or in teams, but in either case, you will receive our mentorship and support for your specific project.

A Lehigh resource that you should keep handy and make a point in using is Phil Hewitt, the Engineering Librarian. Phil brings experience in research both in the academic as well as industry settings, and he has great knowledge of the library resources available at Lehigh. His email is [pjh315@lehigh.edu](mailto:pjh315@lehigh.edu).

Lastly, the entire world is your resource! You are **required to seek at least three Subject Matter Experts**, interview SMEs (outside your organization and Lehigh), do your own research, speak with vendors – there is a whole lot of information out there, feel free to seize it if it helps you to understand and solve your problem.

## How Will Grading Work?

As you might have realized, the project-based courses are a different kind of class. We strive to run them as closely resembling the real world as possible, while also providing the mentoring and guidance characteristic of an academic course. This makes grading difficult – in the real world, there are no grades, and, statistically speaking, at most half of the employees are above average. However, because this is a course at an accredited academic institution, you will receive grades at the completion of the project. Here are a few things that we expect from the students enrolled in the projects:

- You will be very professional throughout the project. This includes being courteous and respectful with the project site staff and mentors, with your colleagues and with the faculty. It also includes being on time for meetings, handing in deliverables that are professional, polished, and on time, and in general, conducting yourself with a high degree of professionalism. We recognize that life happens – if you cannot make a deadline or will be late for a meeting, it is your responsibility to communicate as promptly as possible, with all the parties affected. However, do remember that excuses, even legitimate ones, are still excuses.
- You will complete all the assignments on time, and, when handing them in, you will make sure they meet or exceed the standard required. In short, the work you share should be your best attempt. We encourage you to share working drafts of deliverables so we may give you feedback – by definition they will be incomplete. However, the more thought you put into these drafts, the more you will get out of our feedback (so, a draft that has just the title and nothing else does not meet the standard of a “working draft”; one that has completed sections and has a rough outline for sections that are yet to be finalized is a “working draft” and can receive meaningful feedback.)
- You will prepare and present your work to representatives of the faculty and the Industry Advisory Council, as well as other conferences and workshops, as you see appropriate. For such presentations, you will represent yourself, the project sponsor, Lehigh University and the HSE program with grace and exemplary conduct, making sure that no confidential or inappropriate information is shared, and no disparaging or otherwise disrespectful attitude is exhibited.

It might also be helpful to understand what will not be good to do while working on a project course. We strongly discourage you from any of the following:

- Being late for meetings, not communicating, handing in deliverables late will not paint a good picture of you as a professional
- Being rude or inconsiderate to the staff and mentors on site, the faculty, or your colleagues
- Being careless with sensitive information shared by the project sponsoring organization or its members, or by Lehigh faculty
- Not communicating when deadlines are not met, or when the projects gets delayed

This being said, your final grade will be calculated using many factors, such as the degree of participation and engagement with the project, the quality and timeliness of the deliverables, and the professionalism exhibited during the semester with both Lehigh faculty and project mentors. The following section of the syllabus includes the tentative schedule with all the assignments and deadlines, as well as a visual timeline for the semester.

## Schedule, Logistics and Timeline

Please review the schedule below and note that we will try to follow this as closely as possible. Changes may occur, however. Also, please note that there are weekly deliverables and team meetings. At the weekly team meetings, students as well as course instructors are expected. On a per need basis, other guests may be invited.

Week #	Deliverable/Activity	Details and Notes
1	First Class Project Assignment Team Meeting Plan Up-to-date Resume	Class to be held in MO #355/Zoom on Wed, 8/30, 5.30 pm Team meeting plan agreed on in class Resumes uploaded to Course Site (HSE Hub) by EOD 8/31
2	Progress Report Team Meeting	Due on Course Site on Tuesday, by 7 am Time of Meeting: To be determined in the team meeting plan
3	Progress Report Team Meeting	Due on Course Site on Tuesday, by 7am Time of Meeting: To be determined in the team meeting plan
	Assignment: Questions, SMEs, Publications and Organizations	Assignment Tentatively due on Friday, by EOD
4	Progress Report Team Meeting	Due on Course Site on Tuesday, by 7am Time of Meeting: To be determined in the team meeting plan
	Assignment: Project Charter	Project Charter Document due Friday, 9/29, by EOD Guidelines to be published
5	Progress Report Team Meeting	Due on Course Site on Tuesday, by 7am Time of Meeting: To be determined in the team meeting plan
	Assignment: Project Charter	Project Charter Document due Friday, 9/29, by EOD Guidelines to be published
6	Progress Report Team Meeting	Due on Course Site on Tuesday, by 7am Time of Meeting: To be determined in the team meeting plan Additional Team Meeting Friday, 10/6: Strategizing about the structure of the Final Report
	Final Report – First Draft	First Draft of Final Report due Friday, 10/13, by EOD Guidelines to be published
7	Progress Report Team Meeting	Due on Course Site on Tuesday, by 7am Time of Meeting: To be determined in the team meeting plan
	Final Report – First Draft	First Draft of Final Report due Friday, 10/13, by EOD Guidelines to be published
8	Progress Report	Note day change to Wednesday, 10/18, due to Pacing Break Due on Course Site on Wednesday, by 7am Team Meetings will be agreed upon the prior week
	Midterm Progress Presentations	Presentations tentatively scheduled for Friday, 10/20, 8am - 12 pm or 1-5 pm 30 minutes + 15 minutes Q&A
9	Progress Report Team Meeting	Due on Course Site on Tuesday, by 7am Time of Meeting: To be determined in the team meeting plan
	Final Report – First Draft	First Draft of Final Report due Friday, 10/13, by EOD Guidelines to be published
10	Progress Report Team Meeting	Due on Course Site on Tuesday, by 7am Time of Meeting: To be determined in the team meeting plan

11	Progress Report Team Meeting	Due on Course Site on Tuesday, by 7am Time of Meeting: To be determined in the team meeting plan
	Poster – First Draft	First Draft (Concept) of Poster due Sunday, 11/12, by EOD Guidelines to be published
12	Progress Report Team Meeting	Due on Course Site on Tuesday, by 7am Time of Meeting: To be determined in the team meeting plan
	Poster – Second Draft	Second Draft of Poster due Sunday, 11/19, by EOD Should incorporate feedback from first draft
13	Progress Report Team Meeting	Due on Course Site on Tuesday, by 7am Time of Meeting: To be determined in the team meeting plan
	Poster – Final Draft	Final Draft of Poster due Monday, 12/4
	Final Report – Second Draft	Second Draft of Final Report due Sunday, 12/3, by EOD
14	Progress Report Team Meeting	Due on Course Site on Tuesday, by 7am Time of Meeting: To be determined in the team meeting plan
	Poster Session – HSE Open House	Poster Session Presentations – 12/7 Audience may include: Industry Advisory Council Members, Lehigh Faculty and Students, other industry partners
15	Progress Report Team Meeting	Due on Course Site on Tuesday, by 7am Time of Meeting: To be determined in the team meeting plan
16	Final Report – Final Draft	Final Draft of Final Report due Saturday, 12/16, by EOD
	Final Presentation – Dry Runs	Final Presentation Preparation – Week of 12/11 Exact time and location: TBD
	Final Presentations	Presentations tentatively scheduled for Tuesday 12/19 Exact time and location: TBD Project Mentors, other HSE students and faculty are invited

All deliverables must be submitted via Course Site, following the appropriate guidelines.

All presentation slides must be submitted via Course Site prior to the scheduled presentation.

## The Principles of Our Equitable Community:

Lehigh University endorses The Principles of Our Equitable Community [[http://www.lehigh.edu/~inprv/initiatives/PrinciplesEquity\\_Sheet\\_v2\\_032212.pdf](http://www.lehigh.edu/~inprv/initiatives/PrinciplesEquity_Sheet_v2_032212.pdf)]. We expect each member of this class to acknowledge and practice these Principles. Respect for each other and for differing viewpoints is a vital component of the learning environment inside and outside the classroom.

## Accommodations for Students with Disabilities:

If you have a disability for which you are or may be requesting accommodations, please contact both your instructor and the Office of Academic Support Services, University Center C212 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.