

What We Hope The Year Will Be Like

An imagined semester of Biomedical Innovations, written as a letter home from a student who does not exist, describing the year we are building toward.

PLEASE READ THIS FIRST

This is fiction. There is no such student. Nothing here is a record of anything that has happened, and no real student, family, grade, or conversation appears anywhere in it.

It is a hope, written in the first person because that is the honest way to describe what a course is supposed to feel like from the inside. The lessons, labs, and assignments are the real planned curriculum. The student, the classmates, the group arguments, the mistakes, and the feelings are invented to show what the plan is meant to produce.

About the partner activities. The Cleveland Clinic onboarding and rotation, the John Carroll ethics Mondays, the research morning, and HOSA events appear here as part of the year we are planning. None of them is confirmed yet. Partner schedules are set outside this building, and any of these may move, change shape, or not run at all. Treat every partner activity in this document as an intention, not a promise.

This is the last course in the pathway and it is different from the other three. Nobody hands you the problem. You find one, prove it is real, design something for it, and then defend the design to people who are trying to find the hole in it. Seventeen weeks of that.

WHY I SIGNED UP

I want to build things that go in hospitals. Not be the doctor, be the person who designed the thing the doctor is using and made it not terrible.

My grandmother has arthritis and cannot open her own pill bottles. Somebody designed those. Somebody sat in a room and decided that was fine. I have thought about that for three years and this is the class where I get to do something other than be annoyed about it.

I am not sure yet whether that means engineering or medicine or something between them. This year is partly about finding out.

The rhythm still holds. Monday is the ethics argument, Tuesday is content, Wednesday is build or lab, Thursday is analysis, Friday we submit. What changes is that from week two onward the work is ours rather than assigned, which is much harder than it sounds.

Week 1 • Orientation • January 19 to 26

How the class works, before any of the design work starts.

TUE JAN 19 **Welcome, expectations, and how this class works**

First day, and he did not hand out a syllabus and read it to us. He put a case on the board, asked what we would need to know to solve it, and let us list things for ten minutes. Then he said the list we just made was the course.

The expectations are short enough to remember. Come in ready, write it down, say where your evidence stops. That last one is going to come up constantly.

Turned in: exit ticket → Exit Tickets folder

WED JAN 20 **How to use the class website**

We walked the site: where the day's lesson lives, where the glossary is, where the folder for each kind of work is. Everything I turn in this semester goes to one of a small number of folders, and now I know which is which.

The part I did not expect was the practice section. It is not extra, it is where the WebXam review lives, and it is open from day two.

Turned in: exit ticket → Exit Tickets folder

THU JAN 21 **Cornell notes and the 6 Rs**

Record, Reduce, Review, Reflect, Recite, Revise. We set up the notebook the way it will stay all semester: notes on the right, questions on the left, summary at the bottom.

He made us do the Reduce step on notes we had just taken, which was uncomfortable, because it showed how much of what I wrote down I could not actually say back.

Turned in: notebook page → Lab Notebooks folder

MON JAN 25 **Lab safety, myPLTW, and how to submit**

Safety first, and not as a formality. Personal protective equipment, the Safety Data Sheet, and finding the hazard and first aid sections on a real chemical before anyone touched anything. He calls it earning entry to the lab, and that framing works on me.

Then myPLTW logins and a practice submission, so the first real one is not also the first time I have used the system. This course has fewer labs and more builds, so the submission habit matters more, not less.

Turned in: safety agreement and practice submission → Class Records

TUE JAN 26 **WebXam pretest and goal setting**

The pretest is a baseline, not a grade, and he said that before he handed it out and again after. Mine was low and so was everybody's, which was the point.

Then we wrote down a target and one specific habit to get there. Mine is fifteen minutes a night on the practice section. Seventeen weeks to move it.

Turned in: WebXam practice → recorded in Class Records

Week 2 · January 27 to February 3

Unit: launch. Setting up for a year of our own work.

WED JAN 27 **BI launch and syllabus**

He opened by saying this course has no answer key, which got a laugh and turned out to be literal. In the other three classes the lab has a right result. Here we define the problem and the only test is whether the thing we build actually addresses it.

That is either exciting or terrifying depending on the hour.

Turned in: exit ticket → Exit Tickets folder

FRI JAN 29 **Lab safety and SDS**

Safety again, because we will be in the lab and also using tools. PPE, the Safety Data Sheet, hazard and first aid sections.

Fourth time I have done a version of this across the pathway and the first time it took under a period, which is its own kind of progress.

Turned in: pre-lab → recorded in Class Records

MON FEB 1 **Design notebook setup**

A design notebook is different from a lab notebook. It keeps the dead ends. Every idea, including the bad ones, with the date, because the record of what you rejected and why is the thing that proves the final design was a decision rather than the first idea you had.

Turned in: notebook → Lab Notebooks folder

TUE FEB 2 **First BI evidence entry**

First real entry. We had to observe something in the world and write down a problem we noticed, without proposing a solution yet.

Not proposing a solution is unbelievably hard. I wrote three problems and all three were secretly solutions wearing a problem costume.

Turned in: notebook → Lab Notebooks folder

AT HOME, THE NIGHT BEFORE WED FEB 3 **Submit setup check**

Notebook, safety, first entry.

Turned in: tracker → recorded in Class Records

THAT WEEK AT HOME

Light. Twenty minutes a night. Mostly I walked around noticing things and writing them down, which is technically homework.

The review habit starts now, because the WebXam is in the spring and he has said twice that the students who struggle are the ones who met the content once in January.

Week 3 · February 3 to 9

Unit: the emergency room. First real design problem.

AFTER SCHOOL · SIGNING UP

HOSA, chess, and I started the Cleveland Clinic onboarding, which is real paperwork with a background check and takes weeks. He said start in January, so I did.

For me the Clinic matters differently than for the people going into nursing. I want to see how the equipment actually gets used, because that is where designs fail.

WED FEB 3 **Speed-vs-equity debate** ETHICS DAY

Should an emergency room be designed for average speed or for the sickest patient? Optimizing throughput means the median person waits less and the rare complicated one waits much longer.

I argued for throughput because more people benefit. Then somebody said the person who waits longer under my design is the person least able to survive waiting. I did not have an answer.

Turned in: CER → Claim Evidence Reasoning folder

THU FEB 4 **Stakeholder map**

Everyone affected by the ER, not just patients. Nurses, triage, registration, cleaning staff, families in the waiting room, the ambulance crew who cannot leave until they hand off.

The ambulance handoff is the one nobody in my group had thought of, and it turns out to be a real bottleneck.

Turned in: notebook → Lab Notebooks folder

MON FEB 8 **Patient flow workflow**

Mapping the actual path a patient takes, step by step, with the waits marked. The waits are where the design problem lives.

Our first map had eleven steps and four of them were waiting for information rather than waiting for a person.

Turned in: notebook → Lab Notebooks folder

AT HOME, THE WEEKEND BEFORE TUE FEB 9 **Team contract**

We wrote and signed an actual team contract: who does what, how we decide when we disagree, and what happens if somebody does not deliver.

It felt over the top on Thursday. It was extremely useful in week four.

Turned in: tracker → recorded in Class Records

TUE FEB 9 **ER inefficiency brief**

A brief naming one specific inefficiency with evidence from our flow map. Not the ER is slow. This step, this wait, this many minutes.

Turned in: CER → Claim Evidence Reasoning folder

THAT WEEK AT HOME

Thirty minutes a night plus a group thread about the stakeholder map.

Weekend I redid the flow map from memory and it was worse the second time, which told me I had been copying rather than understanding.

Week 4 · February 10 to 16

Unit: research. Learning what counts as a source.

AT HOME, THE NIGHT BEFORE WED FEB 10 **Research kickoff**

Turning our inefficiency into a researchable question. Ours started as why is the ER slow and ended as how does information handoff at triage affect time to first assessment, which is a question you can actually go and answer.

Turned in: tracker → recorded in Class Records

AT HOME, THE NIGHT BEFORE WED FEB 10 **Credible source check**

Criteria for a credible source, applied to five things we found. Two of ours failed, including one that looked completely professional and turned out to be a company selling the solution it recommended.

That one was the lesson. It was not wrong, it was interested.

Turned in: tracker → recorded in Class Records

WED FEB 10 **Annotation and citation**

Annotating properly: what the source claims, what evidence it gives, and what it does not cover. Then citing so somebody else can find it.

Writing what a source does not cover is the part I would have skipped and is the part that shows you read it.

Turned in: notebook → Lab Notebooks folder

TUE FEB 16 **Submit research notes**

Annotated sources with citations and a summary of what we still do not know.

Turned in: notebook → Lab Notebooks folder

THAT WEEK AT HOME

Forty minutes, mostly reading. Reading a real paper is slow and I am getting faster.

Weekend was the credible source criteria until I could apply them without the checklist.

Week 5 · February 17 to 22

Unit: prototype. CAD, and the team contract earns itself.

WED FEB 17 **ER-ethics debate** ETHICS DAY

Whether a design that helps most patients but disadvantages a specific group is acceptable if the overall numbers improve.

This is Monday of week two again with a sharper edge, because now it is our design.

Turned in: CER → Claim Evidence Reasoning folder

AT HOME, THE NIGHT BEFORE THU FEB 18 **Design brief**

The brief: problem, users, criteria, constraints. Constraints are the ones people skip and they are what make a design real. Budget, space, staffing, and the fact that you cannot rebuild a hospital.

Our first brief had criteria and no constraints, which meant our design could have been anything.

Turned in: pre-lab → recorded in Class Records

THU FEB 18 **CAD floor plan modeling** BUILD

First time in CAD. Drawing a floor plan to scale, which immediately kills ideas that worked fine as sketches. Our redesigned triage area did not physically fit.

Scale is a brutal critic. You cannot argue with a wall.

Turned in: lab report → Lab Reports folder

FRI FEB 19 **Process flowchart**

The new patient flow through our redesign, next to the old one, so the improvement is visible rather than claimed.

This is where the team contract paid for itself. Two of us wanted different layouts and we had already agreed how to decide, so it took ten minutes instead of the whole period.

Turned in: lab report → Lab Reports folder

MON FEB 22 **Prototype revision log**

Documenting every change and why. The log is the deliverable, not just the final plan, because the reasoning is what gets assessed.

Turned in: lab report → Lab Reports folder

THAT WEEK AT HOME

Closer to an hour. CAD is a skill and I had none, so I did tutorials at home.

Weekend was rebuilding the floor plan from scratch to get faster at the tool.

Week 6 · February 24 to March 2

Unit: present, then pivot to physiology.

AFTER SCHOOL · HOSA

HOSA competitive events. I am looking at one on medical innovation, which is close enough to this class that the preparation counts twice.

A few of us worked the Clinic onboarding together in one room, which was much faster than being stuck separately.

WED FEB 24 **Innovation-safety debate** ETHICS DAY

How much testing before a new device reaches patients. Speed against safety, and the people harmed by delay are invisible in a way the people harmed by a bad device are not.

That asymmetry is why this argument never resolves cleanly.

Turned in: CER → Claim Evidence Reasoning folder

AT HOME, THE NIGHT BEFORE THU FEB 25 **Presentation prep**

Preparing to defend the design. He told us the audience is not there to be impressed, they are there to find the weak point, and our job is to have already found it.

Turned in: notebook → Lab Notebooks folder

THU FEB 25 **ER presentation**

We presented. The question that got us was whether our redesign made the ambulance handoff worse, and it does, slightly. We had not measured it because it was not our focus.

Answering honestly that we had not checked was better than the alternative and still did not feel good.

Turned in: lab report → Lab Reports folder

FRI FEB 26 **Physiology variables**

New problem. Human physiology, and what you can actually measure on a person in a classroom: heart rate, reaction time, grip strength, breathing rate.

Turned in: exit ticket → Exit Tickets folder

TUE MAR 2 **Research design ticket**

A testable question with variables defined. Mine was too broad twice before it was answerable.

Turned in: exit ticket → Exit Tickets folder

THAT WEEK AT HOME

Forty five minutes. Presentation rehearsal at home, out loud, which I hated and which is why the handoff question did not derail me.

Week 7 · March 3 to 8

Unit: physiology data. Real measurement, real statistics.

WED MAR 3 **Data-ethics debate** ETHICS DAY

Measuring classmates and then analyzing the results. Consent, and what happens to the data after.

It is easy to treat consent as a form when the subject is sitting next to you. The point is that it is easier to skip precisely then.

Turned in: CER → Claim Evidence Reasoning folder

AT HOME, THE NIGHT BEFORE THU MAR 4 **Experimental vs observational**

If you control the variable it is experimental. If you only watch, it is observational and you cannot claim cause.

Almost every claim I have ever repeated from the internet is observational reported as causal.

Turned in: pre-lab → recorded in Class Records

THU MAR 4 **Physiology sensor lab** LAB

Sensors on people, multiple trials, units on everything. Our first trials were inconsistent because we were not standardizing rest between them.

The protocol has to control the subject as carefully as the instrument.

Turned in: data table → Data Tables folder

FRI MAR 5 **Mean, SD, t-test**

Statistics with a purpose. Mean and standard deviation, then a t-test to ask whether two groups actually differ or whether the difference is noise.

Our difference looked convincing in the bar chart and did not survive the test. That was genuinely deflating and completely the point.

Turned in: data table → Data Tables folder

MON MAR 8 **Submit data table**

Raw data, statistics, and an honest statement that our result was not significant.

Turned in: data table → Data Tables folder

THAT WEEK AT HOME

Forty five minutes. The t-test needed doing by hand once before the spreadsheet meant anything.

Weekend was standard deviation until I could explain why a big one makes a mean less trustworthy.

Week 8 · March 10 to 16

Unit: analysis. How a graph lies.

WED MAR 10 **Biometric-privacy debate** ETHICS DAY

Fingerprints and face data are different from a password because you cannot change them after a breach.

That permanence is the whole argument and I had never framed it that way.

Turned in: CER → Claim Evidence Reasoning folder

THU MAR 11 **Bias, error, graph choice**

How the same honest data becomes a different claim depending on axis range, bar versus line, and what you leave out.

He showed us a graph with a truncated y-axis that made a tiny difference look enormous, then the same data drawn properly. Nobody lied and the two pictures say opposite things.

Turned in: data table → Data Tables folder

FRI MAR 12 **Statistics lab analysis** LAB

Reanalyzing our week six data properly, with the axis honest and the non-significant result reported as non-significant.

Turned in: lab report → Lab Reports folder

TUE MAR 16 **CER mini-report**

Claim, evidence, reasoning, limitations. My claim had to be that we found no significant difference, which is a real finding and does not feel like one.

Turned in: CER → Claim Evidence Reasoning folder

THAT WEEK AT HOME

Thirty five minutes with the break.

Weekend I went back to the ER unit, five weeks old now, because the design vocabulary is going to come back and I could feel it fading.

Week 9 · March 17 to 19

Unit: innovation proposal. Our own problem, from scratch.

AFTER SCHOOL · CHESS

Chess. I am losing less badly. Someone pointed out I commit to a plan early and will not abandon it even when the board changes.

Which is exactly what happened in the design sprint, where I kept trying to rescue my first concept instead of letting it go.

WED MAR 17 **Innovation debate** ETHICS DAY

Whether incremental improvement or radical redesign does more good. Incremental helps sooner and reaches fewer people. Radical might help enormously or might never ship.

Most actual progress is incremental and most attention goes to the radical, which is its own problem.

Turned in: CER → Claim Evidence Reasoning folder

THU MAR 18 **Problem definition**

Defining our own problem, properly, with evidence that it is real and affects specific people.

I brought the pill bottle. Arthritis, childproof caps, and the fact that the people least able to open them are the ones with the most prescriptions. I have wanted to work on this since I was fourteen and this is the first time anyone asked me to.

Turned in: notebook → Lab Notebooks folder

AT HOME, THE NIGHT BEFORE FRI MAR 19 **Design criteria and constraints**

Criteria are what success looks like, constraints are what you cannot change. Mine include that it still has to be childproof, which is the entire difficulty. Easy for weak hands and hard for curious ones are close to opposite requirements.

Turned in: tracker → recorded in Class Records

AT HOME, THE NIGHT BEFORE FRI MAR 19 **Design sprint and tradeoffs**

Fast sketching, many ideas, then killing most. Every idea traded one requirement against another and the log has to say which trade I made and why.

Turned in: notebook → Lab Notebooks folder

FRI MAR 19 **Submit innovation proposal**

Problem, evidence, users, criteria, constraints, three concepts, one recommendation.

Turned in: lab report → Lab Reports folder

THAT WEEK AT HOME

An hour some nights. The proposal took two sittings.

Weekend was a full review pass over the first seven weeks. About a fifth of my own questions I could not answer, and that is now the list.

Unit: validation. Proving the idea is worth building.

WHY I KEEP GOING

Halfway. The week that changed this course for me was week eight, when he asked us to bring our own problem and I brought the pill bottle I have been annoyed about since I was fourteen.

Nobody had ever asked me what I wanted to fix. Every science class before this handed me the problem. Getting to bring my own, and then being made to prove it was real rather than just annoying, is the first time school has felt like the thing I actually want to do.

MON MAR 22 **Source ethics debate** ETHICS MONDAY

Using a company's own research to justify their product, and whether disclosure is enough to fix the conflict.

Turned in: exit ticket → Exit Tickets folder

WED MAR 24 **Literature review**

Finding what already exists. Four products already address my problem and two are quite good, which was deflating for an hour and then useful.

Knowing what exists is how you find the gap instead of rebuilding something.

Turned in: CER → Claim Evidence Reasoning folder

THU MAR 25 **Decision matrix**

Scoring concepts against weighted criteria. The weighting is the argument, because whichever criterion you weight heaviest decides the winner before you score anything.

My matrix picked the concept I already liked until I fixed the weights, which is worth knowing about myself.

Turned in: data table → Data Tables folder

MON APR 5 **Validation plan**

How would we know if it worked? Actual measurable criteria and who we would test with. Mine has to include people with limited grip strength, because testing on my own hands proves nothing.

Turned in: pre-lab → recorded in Class Records

AT HOME, THE NIGHT BEFORE WED APR 7 **MP1 tracker audit**

Marking period audit with an honest confidence rating.

Turned in: tracker → recorded in Class Records

THAT WEEK AT HOME

Forty five minutes. The decision matrix got rebuilt twice.

Weekend was the statistics from week six, because I will need the t-test again for validation.

Week 12 · April 7 to 12

Unit: environmental exposure. The problem is outside now.

WED APR 7 **Environmental justice debate** ETHICS DAY

Why exposure is not evenly distributed, and whether that is an accident of geography or the result of decisions.

This is not abstract in Cleveland and everybody knew it. Quietest and most serious Monday so far.

Turned in: exit ticket → Exit Tickets folder

AT HOME, THE NIGHT BEFORE THU APR 8 **Exposure pathway**

Source, pathway, receptor. You can break the chain at any of the three, and which one you choose is a policy decision disguised as a technical one.

Telling people to stay indoors breaks it at the receptor and leaves the source running.

Turned in: notebook → Lab Notebooks folder

THU APR 8 **Environmental data lab** LAB

Real environmental data, multiple sites, comparing against a standard. Some sites exceeded it.

Numbers about places I have been are different from numbers about nowhere.

Turned in: data table → Data Tables folder

FRI APR 9 **Mitigation notes**

What would actually reduce exposure, ranked by where in the pathway it acts and what it costs.

The most effective interventions are the most expensive and the slowest, which is why the cheap ineffective ones keep getting chosen.

Turned in: CER → Claim Evidence Reasoning folder

MON APR 12 **Exposure map submit**

Map, data, mitigation ranking.

Turned in: lab report → Lab Reports folder

THAT WEEK AT HOME

Forty minutes. The exposure pathway model is simple and load-bearing so it went on a card.

Weekend I looked up the actual monitoring data for where we live. That was not homework.

Week 13 · April 13 to 16

Unit: the claim graph. Two days off, three days of work.

TUE APR 13 **Graph draft**

Straight into building the graph that carries our environmental claim. Axis honest, units labeled, standard marked as a reference line.

Week seven is doing real work here. I would have truncated that axis in February without thinking about it.

Turned in: data table → Data Tables folder

THU APR 15 **CER paragraph**

One paragraph, claim to evidence to reasoning, with the limitation that our sampling was opportunistic rather than random.

Turned in: CER → Claim Evidence Reasoning folder

FRI APR 16 **Claim graph submit**

Graph and paragraph.

Turned in: lab report → Lab Reports folder

THAT WEEK AT HOME

Compressed, close to an hour on the teaching nights.

I skipped the weekend review and felt it the week after. Noting that because it was a choice with a cost.

Unit: public health intervention. From data to a plan.

AFTER SCHOOL · CLEVELAND CLINIC

Clinic onboarding cleared. Twelve weeks from when I started.

For me the point is watching equipment get used by people who are tired and busy, because that is where a design either holds up or does not. You cannot learn that from a spec sheet.

MON APR 19 **Public health debate** ETHICS MONDAY

When a public health measure restricts individual choice for collective benefit, and who decides the threshold.

Turned in: exit ticket → Exit Tickets folder

WED APR 21 **Line list**

Building a line list: one row per case, columns for the variables that might matter. The structure is what makes the pattern findable.

Ours was unusable until we agreed on how to record dates, because three of us used three formats.

Turned in: data table → Data Tables folder

AT HOME, THE NIGHT BEFORE THU APR 22 **Intervention model**

Modeling what changes if you intervene at different points, and how much you would have to do to matter.

Turned in: notebook → Lab Notebooks folder

THU APR 22 **Intervention plan**

A specific plan with a target, a mechanism, and a measure of success.

Turned in: lab report → Lab Reports folder

THAT WEEK AT HOME

Forty five minutes and I made up the review I skipped.

Weekend was the line list rebuilt with consistent formatting, which took twenty minutes and would have taken two if we had agreed up front.

Week 14 · April 23 to 29

Unit: the product. Communicating without lying.

FRI APR 23 **Risk communication debate** ETHICS DAY

How much uncertainty to include in a public health message. Too much and nobody acts, too little and you have overstated what you know.

And if you overstate once, the next message is not believed.

Turned in: exit ticket → Exit Tickets folder

MON APR 26 **Message draft**

Writing for people who are not in this class. Short, accurate, actionable.

My first draft was accurate and useless. It described the risk and never said what to do.

Turned in: CER → Claim Evidence Reasoning folder

TUE APR 27 **Privacy check**

Auditing our own product for what it collects and whether it needs to. The answer for two fields was no, and we had included them because they seemed useful.

Collecting less is a design decision, not a limitation.

Turned in: notebook → Lab Notebooks folder

AT HOME, THE NIGHT BEFORE THU APR 29 **Wireframe build** BUILD

Sketching screens. Our personas were basically us until a teammate pointed out that neither of us is an older person on a slow connection, and half our features served nobody but ourselves.

Turned in: notebook → Lab Notebooks folder

THU APR 29 **Product submit**

Message, wireframes, privacy audit, personas.

Turned in: lab report → Lab Reports folder

THAT WEEK AT HOME

Forty five minutes. The message got rewritten four times, which is three more than I wanted and exactly right.

Weekend was lighter. Spring break next.

Week 15 · April 30 to May 3

Unit: molecular workflow. Two days, then spring break.

FRI APR 30 **Engineered organism debate** ETHICS DAY

Releasing an engineered organism, even a beneficial one, and the fact that you cannot recall it afterward.

Irreversibility is the whole argument. Almost everything else we have designed this year can be switched off.

Turned in: exit ticket → Exit Tickets folder

MON MAY 3 **Workflow notes and controls**

The molecular workflow and where controls sit in it. Positive, negative, and what each one rules out.

Turned in: pre-lab → recorded in Class Records

THAT WEEK AT HOME

Two short nights then nothing. He told us not to do BI work over the break.

Week 16 • May 5 to 10

Unit: transformation. The wet lab.

WEEKEND • THE RESEARCH EXPERIENCE

The optional research extra credit. A university lab hosted a few of us and I spent most of the morning in the engineering side watching a 3D printer build a small device.

The researcher said most of her week is things that did not work, which by now I believe. She also said the best designers she works with spend more time with users than with CAD, which I needed to hear because I like the CAD part more.

WED MAY 5 **Biotech safety debate** ETHICS DAY

Containment levels and who is responsible when something leaves a lab. The answer is usually a system rather than a person, which is comforting and also how nobody ends up accountable.

Turned in: exit ticket → Exit Tickets folder

AT HOME, THE NIGHT BEFORE THU MAY 6 **Transformation notes**

Getting bacteria to take up a plasmid, and why only a small fraction do. The selection step is what finds the ones that worked.

Turned in: pre-lab → recorded in Class Records

THU MAY 6 **Transformation and gel wet lab** LAB

The wet lab. Transformation, then a gel to confirm it. My plate had colonies where the control said there should be none, which means contamination somewhere in my technique.

Four courses into this pathway and my aseptic technique is still the weakest thing I do.

Turned in: lab report → Lab Reports folder

FRI MAY 7 **Gel map**

Mapping the bands against the ladder to work out fragment sizes. My gel was readable despite the plate problem, which is a small mercy.

Turned in: data table → Data Tables folder

MON MAY 10 **Notebook submit**

Protocol, plate results, gel image, and the contamination written into the limitations rather than quietly omitted.

Turned in: lab report → Lab Reports folder

THAT WEEK AT HOME

Forty five minutes plus the exam list. The unanswered pile is under a tenth now.

Weekend I redid the aseptic technique steps in order, because that is twice now.

Week 17 • May 11 to 14

Unit: forensic project and the final portfolio.

TUE MAY 11 **Research ethics debate** ETHICS DAY

The last Monday. Research ethics, and we were asked to name one position we had changed across the whole year.

Mine was incremental versus radical innovation. I came in wanting to build the dramatic thing. I am leaving convinced that the pill bottle nobody writes articles about is worth more than the device that never ships.

Turned in: exit ticket → Exit Tickets folder

THU MAY 13 **Forensic evidence table**

Organizing evidence so somebody else could audit the chain of reasoning. Same discipline as the design log, applied to a different problem.

Turned in: data table → Data Tables folder

FRI MAY 14 **Project question**

Defining the final project question, which after seventeen weeks I can now do in one period instead of three.

Turned in: pre-lab → recorded in Class Records

IN CLASS, FRI MAY 14 **Portfolio audit**

Everything against the rubric. Mine was mostly complete and the gaps were labels and dates, not missing work, which is its own lesson about doing it properly at the time.

Turned in: tracker → recorded in Class Records

IN CLASS, FRI MAY 14 **Final portfolio submit**

Submitted. Seventeen weeks, four design problems, one portfolio.

In January I wrote three problems that were secretly solutions. Today I defended a design with a decision matrix, a validation plan, and an honest list of what I still cannot prove.

Turned in: final portfolio → recorded in Class Records

THAT WEEK AT HOME

Two long nights, then done.

The WebXam is in the spring. My list is short enough now to be a list.

Seventeen weeks, four design problems, one portfolio.

The first thing is that having no answer key is the hardest and best part. In the other three courses I could tell whether I was right. Here the only test is whether the thing actually addresses the problem, and you have to build the test yourself.

The second thing is that the Mondays are why the rest works. I thought ethics day was a break from content. It is where I learned to hold a position, have it taken apart, and change my mind without feeling like I lost. My position on incremental versus radical flipped completely.

The third thing is teamwork, which I was worst at. The concept I would not let go of in the design sprint, the decision matrix weighted to give me the answer I already wanted, the personas that were secretly just us, the line list with three date formats. Every one was caught by somebody else, and the team contract we wrote in week three is why those conversations took minutes rather than periods.

The fourth thing is that the class is not only the class. HOSA, chess, the Clinic badge, the research morning. Chess is where I found out I commit early and will not abandon a plan, which is the same flaw that cost me a day in the design sprint. The research morning is where somebody told me the best designers spend more time with users than with CAD, which I did not want to hear.

What I need from you is what you already do. Ask me what the Monday question was and argue with me. The fifteen minutes a night is not negotiable. And if I say I have no homework, ask me what is left on the list.

I still want to build things that go in hospitals, and I am still not sure whether that is engineering or medicine. What changed is that I no longer think I have to decide right now. What I have is a set of things I can actually do: define a problem so it is real rather than annoying, prove somebody else has not already solved it, design against constraints instead of wishes, and say out loud where my evidence stops.

My grandmother still cannot open her pill bottles. I have a concept, a decision matrix, and a validation plan that says who I would have to test it with before claiming anything. That is not a solution yet. It is the first honest step toward one, and I did not know how to take it in August.

Biomedical Innovations, Spring 2027. Four problems, one portfolio, no answer key. Go Hornets.