WHY I WANT TO BE A \_\_\_\_\_\_\_\_\_\_\_ENGINEER:

HYPOTHESES, “DATA” COLLECTION, & CONCLUSIONS

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# ASSIGNMENT OVERVIEW--

# Why I WANT TO BE A \_\_\_\_ENGINEER: HYPOTHESIS AND VERIFICATION

For this assignment, you will investigate your current thoughts and assumptions about the particular field of engineering you are considering as your major. You will familiarize yourself with that field of engineering, you will assess your suitability for that field, and you will assess that field’s suitability (or lack of) for you. The research for this assignment requires that you consult sources--including “yourself” as a source--that will provide information about the field of engineering you are planning on pursuing. You will begin Assignment #2 with a hypothesis, gather and analyze information from your various sources (this is your “data”), and you will discuss the validity of your initial hypothesis, establishing (based on your data) why and how your potential chosen field of engineering is (or isn’t) a sound, logical, data-supported match for the person you are and want to continue to be.

## ASSIGNMENT DETAILS

Write a minimum 1600-word paper in which you advance a hypothesis regarding you and your chosen field of engineering, then confirm (or “disprove”) the validity of the hypothesis (1600 words does not include Sources and Acknowledgments; you may go over this minimum word count). While you might not be *100%* certain, at either the start or by the completion of writing this paper, about what engineering field you are most interested in, or why you and that field are a good match, carefulresearch (into the field and into yourself), ongoing analyses and integration and analyses of “data” gathered through research/sources will lead you to and iteratively reinforce a currently reasonable conclusion. Your research and your analyses and integration of information will allow you to *show*, *specifically,* why and how your initial, general hypothesis “holds up” (or might not “hold up” or does not “hold up”).

You will organize your paper according to a scientific model of hypothesis, investigation, and verifications/conclusions. In your paper, you will posit a hypothesis (or you can think of it as proposing a theory); you will consult sources and present specific details from those sources relevant to that hypothesis; and, drawing on those research findings, you will state/assess the validity and significance of the original hypothesis. You will use the sections of your paper to present your hypothesis, your research findings, and your verifications/ conclusions.

**There is an I in “Iterate”**

“Science circles back on itself so that useful ideas are built upon and used to learn even more about the [natural world](https://undsci.berkeley.edu/glossary/glossary_popup.php?word=natural+world). This often means that successive investigations of a topic lead back to the same question, but at deeper and deeper levels [1].”

The above quotation, from the UC Museum of Paleontology and the University of California at Berkley, articulates the importance of the “iterative process” in scientific investigation. A scientist pursuing a hypothesis will think and act “iteratively”—will return to processes and data, will give close attention to how one step or one set of data affects another—in order to continue to fine tune and defines and test a hypothesis. As information is discovered and data is gathered and interpreted, as possibilities are validated, as assumptions or previous ideas are called into question, a careful scientist moves back and forth among the steps of discovery and verification.

For this process of iteration—of “back-and-forth”-- to be sound and for this process to produce substantial results, **the scientist is always making sure to address important findings and to show how each aspect of research and testing affects all other aspects of research and testing. A good scientist will always *specify* how all aspects of research and testing contribute to reasonable, responsible verifications and conclusions.**

Your paper will reflect this iterative process, showing how elements of your hypothesis “react” as you discover and introduce variables and how each aspect of your process affects all aspects of your conclusions. Your writing process will be significantly “iterative,” and in your paper you will consistently clarify how all the elements of your paper interconnect. You will be applying an iterative process to all areas and sections of your paper. You must clearly explain how the information in one information area or section of your paper is important to the clarity and authority of the information in all sections. You must clearly explain *how* various “tests” lead to your particular conclusions.

# SOURCE REQUIREMENTS

For this paper you are required to consult a minimum of 6 sources + your “personal research” (“personal research” is explained in subsection “*You* are a resource” later in this assignment):

* Talk with an engineer
* Consult the most recent version (April 2018) of the Bureau of Labor Statistics Occupational Outlook Handbook
* Consult various other relevant sources; these might include
  + newspapers, magazines, and other print and digital publications appropriate to a university-level paper; trade/professional journals and magazines; web sites and other publications of professional engineering societies; company or organization publications/sites; job postings (especially from specialized sites); information from blogs *if* the blog is substantial and appropriate to a university-level paper

Talking to an engineer + the Occupational Outlook Handbook + at least 4 other sources appropriate to an university-level paper = 6 sources. And don’t forget *you.*

Talk To An Engineer

One of the 6 required sources is a conversation (or an “interview”)--in person, by phone, by email, or via Skype/Facetime or a similar app--with an engineer or engineering student in the field you are looking into. For example, if you are considering going into mechanical engineering, you will have a conversation/interview with a mechanical engineer or with a student currently pursuing an undergraduate or graduate mechanical engineering degree. You could also talk to an engineer from another field who has significant knowledge of mechanical engineering or you might talk to a professional who is not a mechanical engineer but who has significant knowledge of mechanical engineering as a field and as a profession. If you are considering going into bioengineering as a precursor to medical school, you will talk with a bioengineer who works in a medical field; or a physician who has a biomedical engineering degree; or a physician or other professional who has significant familiarity with bioengineering.

Your conversation/interview (you may have more than one conversation/interview with the same person) or does not have to last for 3 hours, but asking one question that leads to a 2-minute general answer will not provide you with sufficient source information. Ask questions and/or pursue conversations that are relevant to your work for this assignment. Ask questions that are of particular interest to *you.* Ask questions that will help *you* to more fully understand what X engineers *actually do* and how this professional prepared for doing what he or she does. You might ask questions and/or center a conversation around these types of information:

* How and why did Mr. X decide to be a computer engineer? What did he do, throughout his education, to prepare him for a career in computer engineering?
* What does Dr. Y find most satisfying about her work? Is her work similar to what she imagined it would be when she was getting her education? What does Dr. Y find to be particularly challenging about her career and how does she address/meet those challenges?
* How did Mr. QR come to be an Engineer II at Z Corporation? What does a typical work day “look like” for Mr. QR? What aspects of Mr. QR’s personality and education make him an excellent engineer for Z Corporation?
* What does Mx. WZ do, as a civil engineer and Team Leader, on a day-to-day basis? How did their education prepare them for this work? What has been surprising to them about actually doing a civil engineer’s work on a day-to-day basis? Do they ever have to make decisions that involve ethical issues or dilemmas?
* What does Ms. RQ find to be the most satisfying aspect of her work? In 2008, when Ms. RQ was in his first year of engineering school, what did she *imagine* she would be doing, in her career, in 2018? Is she doing what he imagined he would be doing?

Be sure to take notes on the conversations you have with your selected professional. You must have notes that allow you to recall information and that ensure accurate quoting and paraphrasing.

You may record conversations or interviews, but only with your selected professional’s specific permission. You will be using the “data”—the information—gained through your conversation in your iterative process and some of this data will appear in your paper.

Further Required Sources

You must use the Occupational Outlook Handbook as one of your sources for important data. Other sources (of your choosing) will provide substantial information on working conditions, salaries, job availability, etc. in the engineering field about which you are writing. Be sure to continue to consult the First-Year Engineering LibGuides, always available at <http://pitt.libguides.com/freshmanengineering>.

Remember that *you* are a source (see below) and that the information/data about you must be specific and be thoughtfully depicted, explained, and connected to all other information areas of the paper.

*You* are a Required Source

Assignment 2 requires that you “research” your own experiences, interests, achievements and aspirations.; you will be gathering data on yourself. You will be familiar with using “yourself” as a source, because you already did this for Assignment 1! To facilitate the “personal” research for Assignment 2, you might ask yourself:

* What experiences (be specific!) in my childhood and beyond sparked my interest in engineering?
* What have I done in the past eight or ten years that might indicate \_\_\_\_\_\_\_\_\_\_ engineering is the field for me?
* What kinds of academic or other projects have I initiated, participated in, and/or completed that suggest, when I look back at them, that I would be good at being a \_\_\_\_\_\_\_\_\_\_engineer?
* What experiences or projects have been so interesting and exciting to me that reviewing them leads me to believe that I would find \_\_\_\_\_\_\_\_\_engineering to be a very satisfying career?

As you investigate your own motivations and goals, you should continue to ask yourself:

* What kinds of work do I want to spend my life doing, and why?
* What are my goals, as an engineer and a person, and how will becoming a \_\_\_\_\_\_\_\_\_\_engineer help me to achieve those goals?

NOTE!!! You have already asked a version of some of these questions for Assignment 1. For Assignment #2, you will want to turn these questions towards **why a *particular* *field* of engineering seems to be a *good match for you***. You might, however, want to use short passages of your own relevant, important information from your own paper from Assignment 1. You may quote or paraphrase your own writing from Assignment 1, but you must treat this information as source information, correctly citing (with you as the author) any quotations or paraphrases of your Assignment 1 material. Note that any quotations or paraphrases from your own writing in your own Assignment 1 do not “count” as one of your 6 required sources.

POSSIBLE SECTIONS

**Introduction: \_\_\_\_\_\_\_\_\_\_\_\_Engineering is (Hypothetically) the Field for Me**

In this section you will present your hypothesis regarding the field of engineering that you think, at this point in time, you are most interested in pursuing. Along with your hypothesis, you will present details regarding why you believe this is a reasonable hypothesis at this time.

In your Introduction, be careful to present a clearly stated hypothesis ***and*** accompanying, sufficiently specific details to demonstrate the overall reasoning that led to this hypothesis. In this section you might present statements such as: “I came to the University of Pittsburgh (Pitt) Swanson School of Engineering (SSOE) with the plan of majoring in civil engineering. I have always been interested in the construction of large structures, especially extremely tall urban skyscrapers. From what I knew about civil engineering, this field seemed to be the most likely career for participating in the design and construction of such structures. My research for this paper has reinforced my hypothesis that civil engineering is the field in which I can pursue my interests. A career in civil engineering, with a specialty in structural engineering, will allow me to make use of those mathematical and design skills that seem to be my forte, and I can earn the kind of money necessary for the kind of life I want to live. “

The next sections of your paper will then demonstrate, in detail, why civil engineering is, upon further data collection and analysis, a sound career choice and a sound life choice for *you*.

**Who I am**

For this section, you will engage in and report on your research into “yourself” as a source. You will access and present those details of your own past and current experiences that indicate why a particular field you’ve been thinking about pursuing is (or isn’t) the field you will actually pursue.

The research and details for this section will largely involve your own experiences, interests, achievements and aspirations. Consult the subsection “You are a Required Source” for the kinds of questions that will facilitate this personal research. Further very useful questions to ask yourself might be

* What kinds of working conditions, experienced on a day-to-day basis, appeal to me?
* Would I enjoy working closely with many different types of people in various locales?
* Would I prefer a job that involves working on projects by myself or with a small team in a familiar lab?
* Do I want to travel the world? Is it important to me to live near my extended family?
* Am I the kind of person who likes to be at the center of hectic activity or do I usually need ongoing peace and quiet to be productive?”

In this section, then, you will research and present, in detail and **with concrete examples**/**specifics**, those interests, goals, characteristics, experiences, competencies, achievements that influenced and continue to influence your emerging decision to be a \_\_\_\_\_\_\_\_\_\_\_engineer. The information presented in this section will detail the more “personal” experiences and factors that reinforce (or refute) your initial hypothesis.

What Really Goes On in \_\_\_\_\_\_\_\_\_\_\_\_ Engineering; How is What Really Goes on in \_\_\_\_\_\_\_\_\_\_\_\_\_ Engineering Relevant to *Me*?

In this section (or these next sections), you will draw on your conversation/interview, on the Occupational Outlook Handbook, and on your other sources to describe and explain the details about X field of engineering that are most relevant to *you.* Through your research and your conversation, you should be able to learn about the kinds of work \_\_\_\_\_\_\_\_\_\_\_ engineers actually do; the salary range for \_\_\_\_\_\_\_\_\_\_\_ engineers; the working conditions in the field of \_\_\_\_\_\_\_\_\_\_\_\_\_ engineering; the job prospects for \_\_\_\_\_\_\_\_\_\_\_\_\_engineers; and the kinds of education/degrees usually required for a career in \_\_\_\_\_\_\_\_\_\_\_\_engineering.

These kinds of questions and accompanying research details should help you determine the validity of your original hypothesis:

* Do the details of \_\_\_\_\_\_\_\_\_\_\_engineering you have discovered via your conversation/interview and other research sound appealing to **you**? Why and in what ways?
* Do the details gathered and analyzed from your conversation/interview and other research indicate that **you** would be challenged in positive ways by a career in \_\_\_\_\_\_\_\_\_\_\_engineering? Why and in what ways?
* Are **you** interested in pursuing the kinds of education/degrees required for a career in \_\_\_\_\_\_\_\_\_\_\_\_engineering? Why?
* Do the customary working conditions or situations for a \_\_\_\_\_\_\_\_\_\_\_\_\_engineer seem appealing to **you?** Why?
* Are the kinds of companies or organizations that tend to employ \_\_\_\_\_\_\_\_\_\_\_\_\_engineers the kinds of companies or organizations you think **you** would like to work for (or create or manage or own)? Why?
* Does the kind of work often done by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_engineers match **your** goals for yourself and your vision of yourself as an adult in society? How and why?
* Do the details you’ve discovered your conversation/interview and your other research **suggest a good match between \_\_\_\_\_\_\_\_\_\_\_\_ engineering and the person in your “Who I Am” section?” How and why?**

As you present your research findings, be sure to clearly articulate how these findings are relevant to the information in your “Who I Am” section. In other words, you must clearly and specifically articulate/explain the connections between (or the lack of connections between) the person in the “Who I Am” section and the actual working conditions, circumstances, and possibilities of \_\_\_\_\_\_\_\_\_\_\_\_\_engineering.

Remember, you are not writing a paper about “What \_\_\_\_\_\_\_\_\_ Engineers Do.” You are writing about those aspects of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that are most significant to **you;** you are explaining why you and particular aspects of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are (or are not) a good “match.”

Conclusion: Yes, I Am (Going) Where I Should Be (Going)

In this section, you will revisit your introductory hypothesis and your ongoing iterative process, and you will assess, in detail, the validity of your hypothesis in light of the data you have gathered and analyzed. In this section, you will explain how and why the field you’ve researched does (or might not or clearly does not) suit you. You will **explicitly describe and explain** how, where, and why you see yourself fitting into (or not fitting into) that field; you will **explicitly describe and explain** how and why this field aligns with (or is out of alignment with**) your life goals.** **You will briefly detail the steps you intend to take towards making a place for yourself in that field.** To further clarify and reinforce your assessment of the validity of your hypothesis (and to provide an engaging, high-impact conclusion) you might provide a concretely detailed picture of yourself at work as a \_\_\_\_\_\_\_\_\_\_\_engineer sometime within the next ten years.

## FORMATTING

Your paper will look like this assignment—2 column format, with your title, section headings, spacing, etc. as they appear in this assignment. However, do not rely solely on this assignment document to do your formatting or to recheck your formatting. To make sure you are formatting correctly (and to effectively double-check your formatting), use the FALL 2018 PAPER FORMATTING SPECIFICATIONS FOR ASSIGNMENTS 2, 3, 4. There will *be a 3-point deduction for each major* format error, so give yourself enough time while drafting and completing your paper to make sure *all* formatting is correct.

## CITING AND SOURCES

You will use the same citation system that you used for Assignment 1. Within the text, source material must be cited using a bracketed number. In-text citation numbers go in numerical order beginning with [1]. The first source material that appears in your paper will *always* be [1]. You then cite source information in ascending numerical order. The citation [2] within your paper will accompany information from your 2nd source.

In your Sources section, you will have a corresponding number for *every* bracketed in-text citation number. Your Sources section must be formatted according to the instructions in the **FALL 2018 PAPER FORMATTING SPECIFICATIONS FOR ASSIGNMENTS 2, 3, 4**, and the examples in the **HOW TO ARRANGE “BIBLIOGRAPHIC INFORMATON” IN THE SOURCES SECTION** document.

**YOU *MIGHT* HAVE AN ADDITIONAL SOURCES SECTION**

If there are sources that you consulted, but from which you have not quoted, paraphrased, or summarized you will list these sources in an **ADDITIONAL SOURCES** section. Format these Additional Sources as you have formatted your Sources, except Additional Sources are listed in alphabetical order by author’s last name. **NOTE: you might or might *not* have an Additional Sources section**. You will need an Additional Sources section only if there were sources which were significantly important/helpful to you in writing your paper, but from which you *do not include* information (quotes, paraphrases, or summaries, charts, graphs, etc.) *within your paper*

**YOU *MUST* HAVE AN ACKNOWLEDGMENTS SECTION**

**You *must* have an ACKNOWLEDGMENTS section**. The **ACKNOWLEDGMENTS** section comes last, after your **SOURCES** section and your **ADDITIONAL SOURCES** (if you have an Additional Sources section) section. In your **ACKNOWLEDGMENTS** section, you “acknowledge”—thank; show your appreciation for—individuals or groups (or other types of helpful resources) that assisted you in some particularly useful, important way. For example, if you had some serious discussions with your roommate about your paper, you might thank him or her. Or, for instance, if a friend helped motivate you to keep working on your paper, you might thank him or her. Perhaps a Writing Center Consultant provided useful support in your paper-writing process; you might thank that Consultant. Perhaps a Pitt Tech Consultant helped you solve a complicated problem that was keeping you from saving your paper as you drafted it; you might thank that Consultant.