Writing Assignment 3 • Fall, 2017/2181

A Current Engineering Topic and Related Technology: What Do You Think?

In Assignment #3, you will advance your own views and opinions surrounding a particular engineering-related topic/problem and a technology that addresses the topic/problem. In a 1550 word “position” or “opinion” paper, you will describe and evaluate a current engineering topic; describe and evaluate a specific, related technology; and describe and evaluate a specific example of that technology. You will familiarize yourself not only with what the topic is “about” and how the technology “works,” but also with what opinions and evaluations other thoughtful professionals have about your selected topic, technology, and example. Drawing on your knowledge of the topic, technology, and example, and drawing on your knowledge of what others are saying about this topic, technology, and example, you will advance and support your own evaluations and opinions.

Assignment Process/Tasks

• Consult at least six sources from the past five years (2012-2017). These sources will provide information about the overall topic, about your selected technology/innovation, and will contribute to your writing about personal interest and social impact.

• Identify a current engineering topic/problem—identify an engineering-related topic that various professionals are seriously discussing (professionals might include engineers, scientists, technology experts, physicians, philosophers, ethicists, environmentalists, lawmakers, law enforcement professionals, educators, and/or the writers and journalists who cover significant engineering/science/technology-related topics). Here are some topic examples:
  – Safe drinking water in areas lacking ample fresh water and/or clean water
  – Alternatives to fossil fuels for individual consumer automobiles
  – Eradication of genetically based/transmitted conditions and diseases
  – Improved treatments for particular cancers
  – Viable transportation and/or delivery systems for medications in areas with minimal transportation and/or storage chains/infrastructures
  – Increased availability/use of 3d printers/printing
  – Exploration and potential human population of other planets
  – Effective protection/security for consumer-level electronic communication and transactions

• From within that topic “focus in” on a particular innovation/technology—select a recent/current “technology” that has been or is being developed to address the problems or needs relevant to your overall topic; for example:
  – Desalination for clean, safe, drinkable water
  – Cars that run on electrical energy
  – In-vitro mitochondrial DNA replacement
  – Affordable “desk-top” 3d printers for individual consumer use
  – Nano-delivery systems for cancer-fighting drugs/therapies
  – Medications needing no refrigeration or specialized storage
  – Habitats for human population of planets
  – Encryption software for consumer-level electronic communication

• In many cases, even further focusing-in will be necessary; “focus in” on a specific aspect of technology and/or a specific example of a technology relevant to the problems or needs of your overall topic; for example
  – Battery-powered, plug-in electric vehicle
  – Reverse osmosis (RO) desalination
  – Nanoparticle inhalational therapy for lung cancers
  – Using consumer level, desktop 3d printers for illegal purposes/products
  – Vaccines that are stable over long periods at high/varying temperatures
  – End-to-end encryption for individual consumer smart phones

• From within your focused-in technology, familiarize yourself with specific examples (actual or hypothetical) of your selected technology “in action”; these can be examples currently in place and being used or these can be examples currently being researched or these can be carefully imagined/proposed hypothetical examples; for instance:
  – Tesla Model 3
  – Carlsbad desalination plant
  – Dry powder inhaler therapy for lung cancer
  – Bigelow Expandable Activity Module (BEAM)
  – Removal/replacement of donor mitochondrial DNA
  – 3d printing of plastic firearms
  – Thermostable Ebola vaccine
  – Digital key encryption of individual consumer smart phones

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• Write a 1550 word paper in which you carefully and clearly
  – describe the topic ↔ advance and support your opinion about its significance to society, to engineering, and to you
  – describe/explain a technology that addresses the problem or problems associated with the topic → describe/explain a specific type of that technology ↔ advance and support your opinion about the usefulness/value of this specific type of technology to society, to engineering, and to you
  – describe/explain an example of your type of technology “in action”; show HOW the specific technology “works” to address the topic-related problem ↔ based on this example, continue to advance and support your opinion about the value of this technology to society, to engineering, and to you

A visual of how you might proceed with your research towards a topic/problem; technology; and example

Overall Topic/Problem--For example: clean, fresh water needed in areas with low availability of clean and/or fresh water

Technology/innovation that addresses the problem--for example: desalination of ocean/sea water

Specific type of that technology/innovation--for example: reverse osmosis desalination

Specific example of that type of technology/innovation--for example: Carlsbad Desalination Plant, San Diego, California

In your research, you are looking for descriptions and explanations of the technology and for evaluations and opinions of other professionals (engineers and/or scientists and/or ethicists and/or environmentalists and/or educators and/or local or global humanitarian agencies and or writers, etc.).

Another visual

Security for consumer-level electronic communication

End-to-end encryption of consumer smart phone communication

Apple's iMessage encryption

New York drug-related criminal case involving Apple iPhone encryption

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REMEMBER: Assg. 3 is “about” YOUR opinion and evaluations; as you are researching, you will be using your research to help you form, articulate, clarify, and support your own evaluations and opinions regarding the importance of your topic/problem and the value of the relevant, selected technology and example:
REMEMBER: Assg. 3 requires that you

- “…advance and support your opinion about its [the topic’s] significance to society, to engineering, and to you”
- “…advance and support your opinion about the value of this specific type of technology to society, to engineering, and to you”
- “…based on this example, continue to advance and support your opinion about the value of this technology to society, to engineering, and to you

HERE ARE SOME IDEAS to help you think and write about “…the usefulness/value…to society, to engineering, and to you”:

- Engineering does not take place “in a vacuum,” and your interest in a topic and a particular technology has not arisen from “nowhere.” Something about you—your past, your experiences, your passions, your interests—influenced your choice of overall topic and of a particular related technology for Assignment 3. Even if you began your research with only the vaguest idea of what kind of engineering or what kind topic you might investigate, something caught your interest as you proceeded with your research. There are reasons why you selected this topic, this technology, and this example:
  - From Assignments 1 and 2, you have already become somewhat familiar with the process of “researching yourself.” For Assignment 3, you will continue to “research yourself” in order to more fully understand and write about why this topic and this technology are important to you.
- The assignment requires that you “explain how and why this topic and, in particular, this technology are important “to engineering.”
  - In your opinion, why should your selected topic and technology be important to engineers? What is your opinion regarding why engineers should continue to pay attention to your selected topic and your selected technology? What, from your research and from your own desire to be an engineer, influences/”informs” your opinion?
- You will be detailing your opinion about why your selected topic and the related technology and example are important to “society.”
  - Be sure to specify/explain what you mean by “society”/”societies.” For example, do you mean to a particular geographic community (for instance, the San Diego area)? Do you mean to a particular geographic community and the surrounding communities/societies (towns? states? country?)? Do you mean this topic and technology are important to people who have or who are at risk for a certain illness? Do the benefits to this society of people with X illness extend to members of the surrounding “society” that do not have and may never contract that illness?
- Why, if a topic and a related technology are important to “society,” might that topic and technology also be important to engineers and to you?”