

## **BIOMIMICRY HOMEWORK ASSIGNMENT #1**

### ***An Extension of In-Class Activity #1***

#### ***Grand Challenges in Engineering***

**Task 1.** Review the 14 Grand Challenges for Engineering in the 21<sup>st</sup> century, available here:

<http://www.engineeringchallenges.org/challenges.aspx>. Identify the one that you want to focus on for the rest of this assignment.

Note that you will be utilizing biomimicry and some of the Grand Challenges may be better aligned with biomimicry techniques than others.

**Task 2.** In a Word document that you will turn in as part of this assignment, summarize, in your own words, the Grand Challenge that you will be tackling. This should be at least two paragraphs. You should include what the problem is, how prevalent it is, and why it is a problem. If appropriate, use bullet points after your written paragraphs and break the Grand Challenge down into smaller problems to be solved.

**Task 3.** Browse the internet and try to find out if anyone has ever solved some or all of the challenge you are focusing on (or the related smaller problems) before. This could be a commercial product/service, or an emerging research development (you might want to search publications in Google Scholar). You do not have to do an exhaustive search, but after looking for a while (~15 minutes) move on to Task 4, regardless.

**Task 4.** If you find that there are existing products or emerging research that aligns with your challenge, then create in your Word document a company (or research) overview about their solution and how it works. After you write about the company, also include a short written evaluation about how likely it was that the solution that you found was inspired by nature in some way. Also identify and briefly discuss the closest natural phenomenon you can think of that their solution reminds you of.

If you do not find an existing product or emerging research, instead type a compelling letter to the National Academies of Engineering (NAE) about where specifically there is an opportunity for research and development. Be explicit, identifying a process/phenomenon from nature that you believe can be adopted in a solution of this Grand Challenge and provide evidence for why.

### **DELIVERABLES**

#### **Submit the completed Word document on Isidore**

Grading for these deliverables is out of a total of 50 points and will be based on completion of the tasks and overall quality and thoughtfulness of your deliverable. Individuals earning the highest grades on this assignment will have demonstrated an outstanding effort and thoughtfulness on this assignment, which will include in-depth and thorough written responses and reflections that are relevant to the assignment's focus. Highest scoring papers will look and read professionally, being nicely organized and well edited.