Assignment for Systems and Synthetic Biology (BIOL 4321) The aim of this assignment is to design a novel gene circuit and present it in written format. To perform this assignment, you will work in a group of two. Each written assignment will receive one grade for both students so please ensure that you have equally strong contribution from both yourself and your partner. You are free to choose your partner to write this assignment. Please email me with your partnership by Friday, January 17th, 2020. Your circuit has to be novel (i.e., new, never been shown before). It can be a variation (change in circuit components or circuit logic) on a previously developed circuit but must have a new function, which will lead to additional insight. The specific circuit design, and its implication, is up to you. You can choose any components (i.e., genes) that you want to build your circuit but at least two must interact in order for the circuit to work. One key component to this assignment is that your circuit has to either a) address an open question in systems biology (e.g., examine genetic architectures that lead to oscillations), b) be used to study ecological/evolutionary question (e.g., how does engineered behavior x affect evolution) or c) have a an application (e.g., kill cancer cells). Written assignment: Your assignment should include: 1) Background information (2 pages): This section is designed to give the setup for the question that your circuit is going to address. What do we already know about the subject? Why is the subject important? Why study the topic? 2) Your question (one paragraph): The question should be clear (i.e., the goal of this assignment is to propose the construction of a gene circuit towards understanding x). 3) Gene circuit design (4 pages, including figures): In this section you need to describe the following components​ a) what are the components of your gene circuit b) how are they assembled and what is the logic (e.g., how do they interact to produce the behavior [a figure is required to for a) and b)] c) what equations/how best to do you think you could model this system d) what are the anticipated the results with your circuit [a figure is required for c) and d)] e) how do these results directly address your question 4) Conclusion (1 paragraph): If everything works out, what do you think the overall results will do for society and the greater good (science, medicine, etc.) 5) References (as much space as you need). For references, please use primary literature, review articles or textbooks only. Please do not use websites, as they are not very reliable (outside of the BioBrick website). To write a good assignment, you are going to need at least 5-7 references (if not more). The proposal should contain two images (have to be original/made by you) as indicated above. One image should describe the circuit and its logic (think about images we have seen in class and use these to guide you). The second image should visually describe the anticipated results. Please imbed these images directly into your assignment. These can be constructed in any software that you like (PowerPoint works well). They do not have to be elaborate. Think of the easiest, clearest and simplest way you can convey your message. There are three potential pitfalls that you should be aware of: a) Spending too much time picking a research question. I don’t expect you to come up with the cure for cancer. Please pick an open question that interests YOU. b) Spending too much time designing your circuit. If you can make a simple circuit to answer a great question, this is best. However, elaborate circuits are welcome so long as they serve a purpose (i.e., address your question) c) Not making it clear how your circuit will address your open question. Make sure the logic in your circuit is sound and that the behavior addressed by your circuit addresses your question. Your assignment should be double-spaced, 12 point Times New Roman, 1” margins. Please provide a brief caption for each figure and reference each figure at least once in the text. This assignment is relatively short in typed length, as I believe that quality vastly outweighs quantity. We chose DNA Biotechnology. We have to chose something that has to e new in this topic and propose it and try that it is very good that somebody think in buy it. We are not going to sale it but the idea is that it look so good that you want to buy this circuit. I will give you some help resources that the professor give to us.Please this assignment is 75% of my grade i have more of 1 day but if you can give me some ideas first to see which one is better, i will appreciate it. Thanks. I WILL SEND YOU SOME INFORMATION BY EMAIL. Please follow the instruction because the las semester I pass a class in C because all the appear that here help me were wrong for tat class, but for other class some of then help me to passed with A.