Thermodynamic engineer

Team 393X

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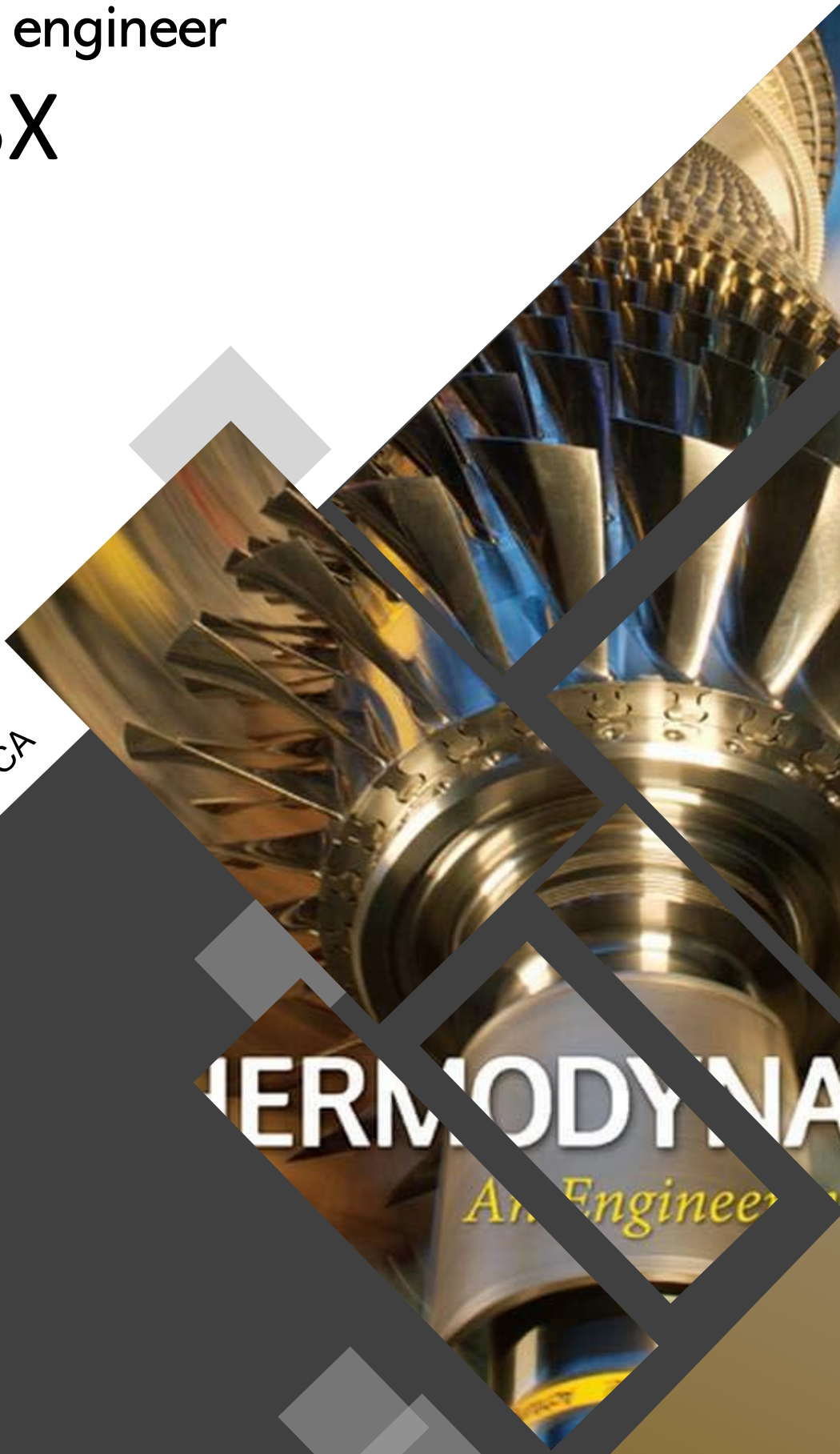
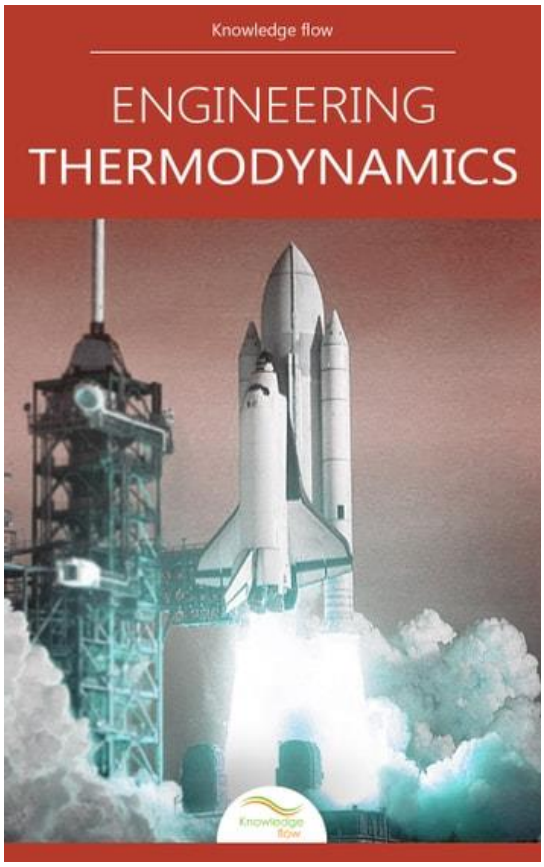
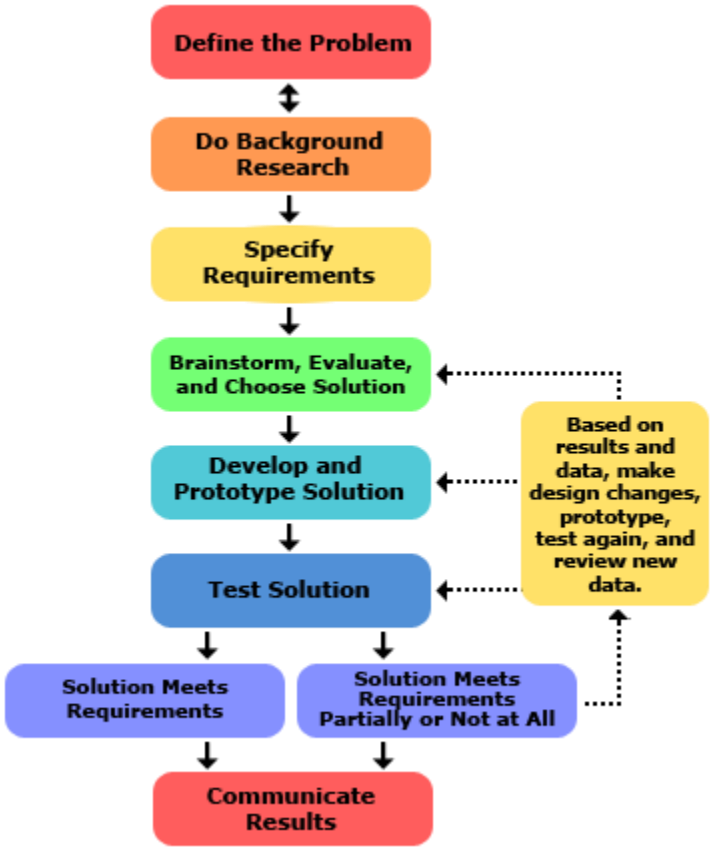


Legacy Magnet Academy, Tustin, CA

I chose the Career of thermodynamics engineering. Thermodynamic engineers are pros who specialize in the application of thermodynamics, which is a branch of physics that deals with the relationship between heat, work, and energy. Since thermodynamic engineers are experts in heat, they often work in the HVAC (Heating, ventilation, and air conditioning) and refrigeration, Power generation, and aerospace.



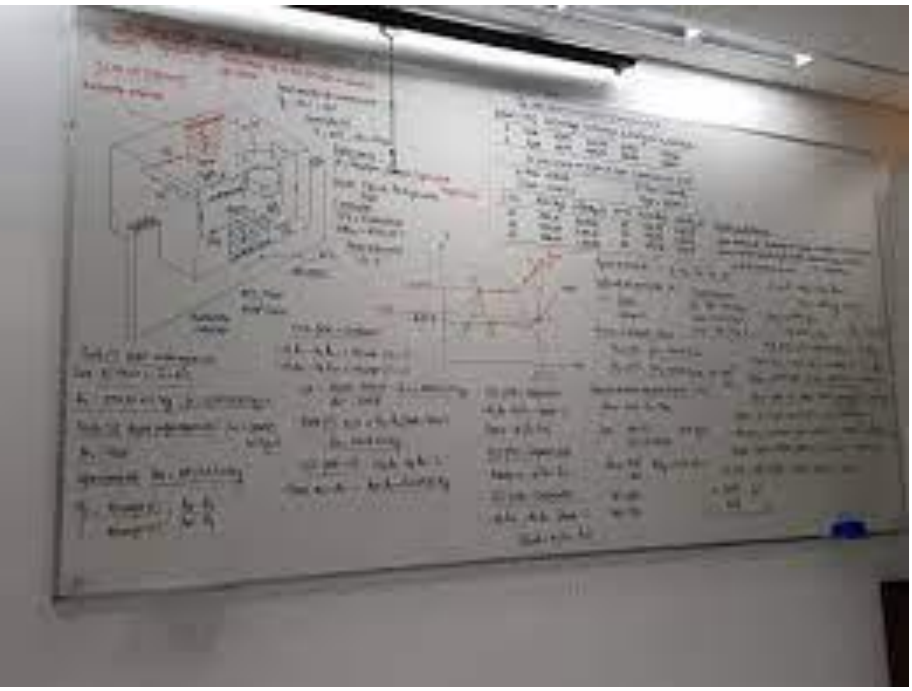


Thermodynamic engineers use multiple processes to figure out how to fix problems or design stuff. However, I will be talking about the engineering design process (EDP). Now, I will discuss how they use each step of the design process in the later pages.

Step 1 Define the problem.

Thermodynamic engineers need to define problems that are related to thermodynamics, such as improving the efficiency of a heat exchanger, designing a new refrigeration system, or optimizing a heat generator. But if a thermodynamics engineer works in the field of a spaceship, they might have to define a problem with the shields that protect the craft from the insane heat of launching to orbit. These are all ways that they could be the first step of the EDP process.

Step 2 Research or gather information.



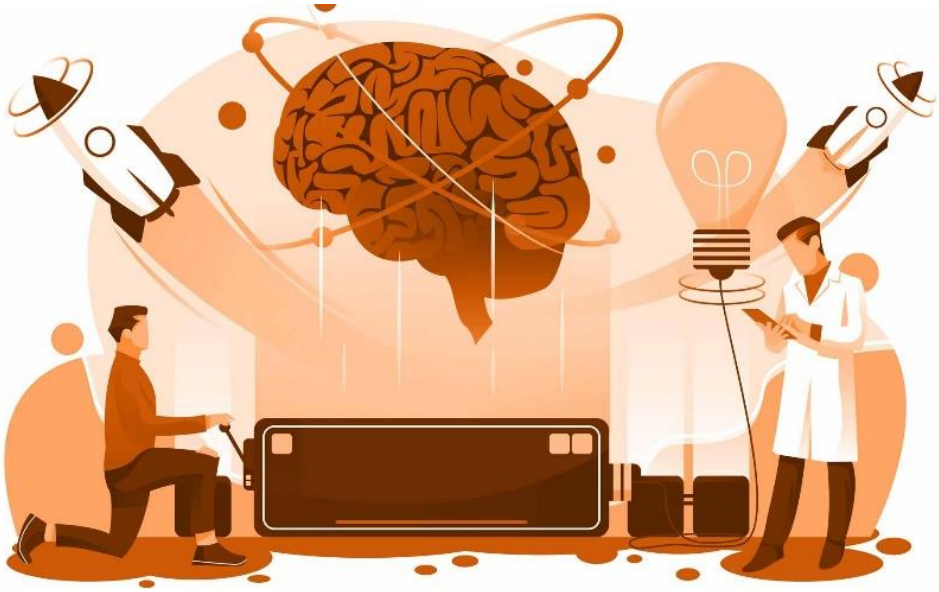
Now after they define the problems, they would have to research information that helps their problem and could solve it. Now they could do this by researching the proper formulas. Or that they could figure out what they did wrong by using the knowledge they have, and then applying it to these steps.

Step 3 specify requirements.

Thermodynamic engineers then are required to see if this passes requirements such as guidelines, and safety standards, and check what the minimum quality is for the thing.

Step 4 Brainstorm/evaluate.

After the engineers do these steps they then start brainstorming and evaluating their situations to come up with plausible solutions because engineers want quantity over quality because with more quantity there will have to be a quality solution. For example, when I talked about figuring out a solution to making panels for a spaceship they could make a solution like changing the material or changing how thin it is with a new material etc.



Step 5: Develop solutions.

After this, they then have to pick the best solution. But that's not all as they also need to build the solution and there are many ways to design these

solutions digitally by using various resources such as CAD, blender, and other resources. And they can do a quick test on this software to make sure that it doesn't fall apart. For example, for the spaceship panel, they could design this using CAD and then put it through a slight test and make sure that it won't fall apart.

Step 6: Test solution.

Test solution

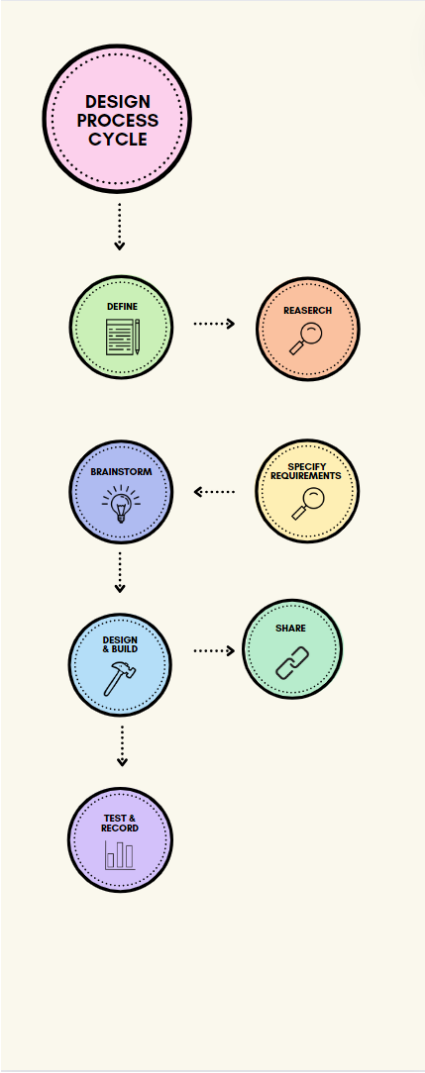
After they do all of these steps they start to do a final test where they put the space panel through many vigorous tests such as stress test, heat test, and make sure that the material won't degrade in the harsh environment that is space.

Step 7 Communicate results.

After all of this, they finally start to communicate results, which is the last step in the process. In this step, the engineers communicate results with each other and figure out if this is good enough, and if it isn't they have to start over the design process to improve the solution that have come up with.

How this differs from us.

Thermodynamic engineers' first 2 steps are like ours, but where it starts to differentiate is in the 3rd step. For them they go on to specifying the requirements, but for us we go straight to brainstorming instead and after we brainstorm, we then specify our requirements. After all of this we then start to develop plausible solutions. But then we do another skip to communicate results, we do this because all of us might have different ideas. So, we the communicate step to communicate between us to get the best solution.



How VEX prepares me for this career.

VEX can benefit me, because it allows me to elaborate my creativity in building a bot. Not only does vex let me do that but it also allows me to express my passion in engineering. The last reason that VEX helps me is, because I want to

become a thermodynamic engineer, I have to learn how heat and physics work together. Vex helps me with this goal because I have to learn about friction and how to cool down motors using various tasks.

Sources:

1. Indeed.com
2. Allthescience
3. Engineering.com
4. Hello Vala
5. Utilities one

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