



STUDENT EVALUATION RESPONSES DECEMBER 2022

“...be bold, change the world”

MECH-420 Heat Transfer

Fall 2022

Often there is discussion regarding the development of independent thinkers and how to achieve? The development of the independent mindset is never achieved by providing all the questions and all the answers! All researchers will agree that at the beginning of any research endeavor that one will never know all the problems and will never have all the answers. But the hallmark of the independent mind is having a problem-solving mentality, having the ability to self-learn, having the ability to extrapolate data and to form conclusions, and having the fortitude to be unafraid to seek answers from multiple independent sources. Academic institutions at all levels have a formidable task for the 21st Century to transform student learners from an environment where “likes” and “dislikes” are more important than learning and demonstrated knowledge. Institutions that are successful will provide the next generation of independent thinkers that will face significant challenges in the next 20 years, considering the massive rate of technological advancement.

In the next 25 years, the world we will see a cure for Cancer and harvest new unlimited energy resources. We will reach out and start to colonize other planetary worlds, will discover new materials that will forever change our understanding of interactions at a scale smaller than ever imaginable, will start to control and hopefully reverse the ravages of global warming and climate change, will be able to see further back into the past than ever imagined and we will begin to understand the origins of “everything”. Academic leaders are faced with the challenge of teaching materials and concepts that have not changed for 100 years and are challenged to prepare students to solve problems that we cannot even imagine today, and to prepare students to develop and to use tools based upon concepts that have not even been conceived. We live in a daunting academic environment, and the only solution is to focus on student development that embraces discovery and inquiry, and to develop a mindset that “rejects” being told all the answers and to develop a mindset that expects to be challenged and to understand that it’s “ok” to not know the answers. Rather the most important skill that we can impart to students is to develop an understanding of the “*process and roadmap*” to find and to understand answers to unknown problems and questions, that we can only dream about today. It will be these students and these institutions that will contribute to the long-term survival and the universal expansion of humankind.

1. *Engineering design is the execution of applied physics for the development of technical solutions for challenges facing the survival of mankind, and the technical communications of those solutions. Please comment on if you think MECH-322/420 Fluids Mechanics/Heat Transfer and a focus on parametric thought has enhanced your skills and ability as a student, and as a future engineering professional, relative to engineering design thought and technical communications. Why or Why Not?*

Question 1:

- A. Parametric thought is a good method, especially for technical/Math intensive courses. It helped when working through very step-intensive problems.
- B. I felt that the material was taught, but really hard to follow in class.
- C. I believe that Dr. Berry focused on parametric thinking when it comes to learning heat transfer. It may not have been the easiest way to learn for some, but it was on the PPT slides.
- D. Yes, the process helped with problem solving.
- E. Yes, but it wasn't as helpful to be honest.
- F. Not really, by this point in my academic career I have already developed a problem-solving mentality that is the basis of all engineering. Personally, I don't think I will use this knowledge too much due to my career being based on physical design of parts rather than testing/researching.
- G. I had the pleasure of having Dr. Berry for both Mech 302 and 420 and while his courses are much more difficult than others, it makes you actually think about the problems not just plug & chug #'s which makes you a better engineer.
- H. Yes, I believe this course has increased my ability as a student because of the challenges and problems we have solved throughout this course.
- I. I think I learned the basics of heat transfer which will always be helpful but it was too much material in such a short time that I won't be able to retain most of it.
- J. Heat Transfer has increased my skills and abilities because it really pushed my ability to analyze a problem and solve all the unknowns before I was able to solve for the desired variable.
- K. Yes, I believe that 420 has made me a better student. Through Dr. Berry I have enhanced my problem-solving abilities. Although 420 was a very challenging course I believe that I am a better student because of it.
- L. I have never tried so hard to pass something in my life. So, it taught me to try hard.
- M. More in the actual course content itself, Mech 420 taught me tenacity and instilled within me a determination to push myself past my limits in order to achieve my goals.
- N. This course has enhanced my ability to think critically and think about what the root of a problem is rather than simply finding an answer. This course helped me consider more factors than ever before when solving problems.
- O. Yes, overall, I did indeed learn a lot from this class. On the other hand, to do well in the course it required a ridiculous amount of time. On **multiple** occasions, I spent around 15 hours

straight for take home assignments & studying. Its problems are unnecessarily complicated & become much less beneficial to actually learning.

- P. Yes, I think parametric thought is a helpful skill for engineering thought in the growing world of excel sheets as it allows us a quicker way to adjust information.
- Q. I think this call gave me a better understanding of Heat Transfer and the real world applications.
- R. I think it does because the class taught me to think critically and follow my units.
- S. This course has definitely increased my logical thinking as many times I would apply a formula, these classes taught me how to consider the problem before diving in.
- T. I believe that the Mech 420 (Heat Transfer) has enhanced my skills & abilities as not just a student but as a future engineering professional.
- U. Overall, no, while I like to say it did, the field and focus of my career won't be impacted much by this class. I have more respect for those who can do it but I've seen and done digital heat transfer with simulations, so I don't like the written element.
- V. I think Mech 322 & Mech 420 will allow some brain checks in the field. I know assembly machines have static difference which must be dissipated. I also think machine processes create a lot of heat which is good to check but a lot of professions have money to run physical tests allowing 2 checks math & experience.
- W. I think it has helped me to take this class a little bit. It introduced me to a lot of new concepts, but it was covered in such a great detail. I'm afraid it will be difficult to retain all of it.
- X. Yes, It was due to the increase of my engineering abilities.
- Y. Heat transfer has definitely challenged me in ways I didn't realize I was lacking. The struggle I had with one material forced me to learn a parametric thought process that will allow me to be a better engineer.
- Z. Yes, Parametric focus will help for engineering & design. Learn to think more dynamically. Do not think: 1. Problem, 2. Equation 3. Solution. Do think 1. Problem, 2. Method/process 3. Parametric solution.
- AA. This class has definitely had an impact on my ability to think creatively and critically as a student. The ability to analyze problems and think of ways to approach them has increased.
- BB. I believe this course has enhanced my learning of engineering design thought and technical communications because of the material and type of problems that we solved. Understanding this thinking & process has helped me with this course.
- CC. Heat Transfer and or focus on parametric thought has absolutely enhanced my skills and ability as a student and future engineering professional. I will carry the skills learned in this course into my career starting right after this course.

DD. Yes, but to a point, these topics have given me a better understanding of the world & how things interact. These classes are challenging & at times take time away from me learning about topics that could apply to me better in the future.

EE. Yes, I already approached things parametrically but a class that emphasizes that is beneficial.

FF. I think this course has helped me see that there is a process to solving every problem, but more that understanding the process you have to understand what is actually occurring in the problem so that you pick the correct solving process and avoid a tragic drowning in the equation swamp.

GG. In order to do well in Mech 420, you must understand the big picture as well as the definitions. You must also pay attention to the little things. These skills that you learn in Mech 420, along with the content, are directly applicable to the real world. To succeed in the real world as an engineer you must pay attention to the little keys and fully understand what it is that you're doing.

HH. Yes, I do believe that Fluid Mechanics/Heat Transfer has enhanced my skills and ability as a student. I believe these concepts may become very useful in my further career, even if I forget the exact solutions & equations. I will have background knowledge.