The George Washington University

Fall 2017, MAE 3145 Orbital Mech & Space Dynamics Section 10
Instructor: Kulumani, Shankar (Primary)

THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, DC

There were: 23 possible respondents.

	Question Text	N	Top Two	Avg	MAE Avg	MAE SD	Sch Avg	Sch SD	Gen Ed Req	Maj/Prog Req	Interest	Instructor	Fits Schedule	Advisor Rec	Friend Rec	Other					
1	Primary reasons for taking course	17							53%	88%	71%	0%	12%	6%	6%	0%					
									Not At All - 1	2	3	4	Completely - 5	N/A							
3	Covered objectives	16	80%	4.1	4.5	0.8	4.5	0.9	0%	6%	13%	44%	31%	6%							
									Lectures	Discussions	Clickers	Activities	Homework	Labs	Project/Folio	Teamwork	Presentations	Guest Lecturers	Fieldwork/ Trips	Writing	Other
4	Contributed to learning	18							83%	17%	0%	0%	89%	0%	83%	6%	0%	0%	0%	0%	0%
									Yes	No											
6	Academically prepared	18	78%	0.8	0.8	0.4	0.8	0.4	78%	22%											
									1 Hour Or Less	1-2 Hours	3-4 Hours	5-6 Hours	7-8 Hours	9-10 Hours	11-13 Hours	13-15 Hours	15+ Hours				
7	Time on coursework outside of class	18							0%	0%	0%	0%	6%	28%	17%	11%	39%				
									Memorizing	Applying Basic	Synthesizing	Judgments	Applying New	Solve Problems	Thinking	Teamwork	Reading	Presentation	Lab	Writing	Other
8	Significant aspects	18							33%	78%	39%	39%	89%	83%	33%	6%	6%	0%	6%	6%	11%
									Not At All - 1	2	3	4	Very - 5	N/A							
10	Intellectual challenge	18	89%	4.7	3.9	1.0	3.9	1.0	0%	0%	11%	11%	78%	0%							
									Little - 1	2	3	4	Lot - 5	N/A							
11	How much learned	18	83%	4.3	3.9	1.1	4.0	1.1	0%	0%	17%	39%	44%	0%							
									Str Disagr - 1	2	3	4	Str Agr - 5								
12	Did best work possible	18	94%	4.7	4.1	0.9	4.2	0.9	0%	0%	6%	17%	78%								
									Str Disagr - 1	2	3	4	Str Agr - 5	N/A							
15	2D Orbital analysis	18	94%	4.6	4.7	0.6	4.7	0.6	0%	0%	6%	28%	67%	0%							
16	3D orbital analysis	18	78%	4.3	4.5	0.8	4.5	0.8	0%	17%	6%	11%	67%	0%							

17	Newtonian physics	18	94%	4.6	4.6	0.6	4.6	0.6	0%	0%	6%	28%	67%	0%							
18	Patched conics	18	67%	4	4.3	0.9	4.3	0.9	6%	0%	28%	22%	44%	0%							
19	Impulsive orbital maneuvers	18	72%	4.2	4.5	0.8	4.5	0.8	0%	0%	28%	28%	44%	0%							
20	Orbital position	18	83%	4.3	4.5	0.7	4.5	0.7	0%	6%	11%	33%	50%	0%							
21	Three-body problem	18	53%	3.4	4.1	1.1	4.1	1.1	11%	22%	11%	17%	33%	6%							
22	Matlab STK	18	15%	2	3.6	1.5	3.6	1.5	44%	6%	11%	0%	11%	28%							
									Not At All - 1	2	3	4	Very - 5	N/A							
23	Knowledgeable (Kulumani)	18	89%	4.7	4.6	0.8	4.6	0.8	0%	6%	6%	6%	83%	0%							
									Low - 1	2	3	4	High - 5	N/A							
24	Enthusiasm (Kulumani)	18	71%	3.9	4.3	1.0	4.4	1.0	6%	11%	11%	22%	44%	6%							
									Str Disagr - 1	2	3	4	Str Agr - 5	N/A							
25	Treats students with respect (Kulumani)	18	56%	3.4	4.4	1.0	4.5	0.9	6%	22%	17%	33%	22%	0%							
									Not Fair - 1	2	3	4	Very Fair - 5	N/A							
26	Fair grading (Kulumani)	18	61%	3.6	4.2	1.1	4.3	1.0	0%	11%	28%	56%	6%	0%							
									Not At All - 1	2	3	4	Excellent - 5	N/A							
27	Feedback (Kulumani)	18	67%	3.5	4.2	1.1	4.2	1.1	11%	0%	22%	61%	6%	0%							
									Poor - 1	2	3	4	Excellent - 5								
28	Overall rating of instructor (Kulumani)	18	50%	3.2	4.1	1.1	4.1	1.1	17%	17%	17%	33%	17%								

Text Responses
Question: If you selected Other as significant aspect of effort, please comment.
Learning a new computer program and using code to solve problems.
Coding
Creating computer programs to compute orbital elements
Question: Use this space for comments on strengths of the course.
I absolutely loved this class, as I got to learn about orbital mechanics and write codes that can predict orbits of satellites given real data. Learning Python has helped me in other classes as well.

This course provides an amazing introduction to space travel and mechanics of how spacecraft behave in space. This course covers everything needed to identifying orbits of objects, the various reference frames that you need to classify the characteristics and much more.
Taught a lot, showed how to use this math to find the actual location of spacecrafts, a useful tool going into aerospace concentration. But everything that I learned in this class, I taught to myself through homeworks. The professor did not do any direct examples to help with solving any problems.
The course material was relevant and interesting
Teaches Python through hard work
Lots of information, good lectures
I learned a lot, including useful skills such as coding in python. Instructor was a good lecturer. Material was interesting and was often tied into real world problems using real data. Despite all the work, I really enjoyed this class and it was one of my favorites I've taken at GW
I learned a lot from this class, but all outside of the classroom
I learned more in this class than at any other class at GW. The material was very interesting and the instructor was clearly qualified to teach this class.
Very well taught, organized, and effective. Felt like I learned alot.
The material is very interesting and is my first taste as aerospace engineering so it was great to be able to learn about something I care about
be reasonable in signing homework, we tend to fail other classes because of the time spent on hw
Question: Use this space to provide suggestions on how to improve this course.
Lower the workload, providing homework/projects that are more related to the subject matter and closely correlate to the exams
The homework assignments were incredibly long and sometimes repetitive. I understand that difficult homeworks are essential to fully understanding the material, but I think that the homeworks had too many questions. At some point, more homework problems leads to stress and does not help me learn. Though I appreciated learning python, I would have appreciated more guidance in coding. I learned most of the language through trial and error, and lots of googling. For the most part, I taught Python to myself and it would have saved me time and effort if I had been properly taught the syntax.
I think this course is at a good level. It has a lot of work associated with it, but the work is all meaningful and I didn't ask myself why are we learning this, this seems useless. Putting in your best effort for this class really brings a best outcome situation.
20% of our grade in this class is projects that require python coding. 35% is homework that can only fully be done creating python codes, outside of the time being spent on homework. With this much relying on coding knowledge, python should have been taught to us. Instead of just telling us something was due in python code, spending a few lectures teaching us even the basic syntax would have been extremely beneficial. A few slides on blackboard about how to print a line of code is not equivalent to printing plots and matrices. This was not a reasonable request. Also, for future courses taught by Shankar, I would much rather learn how to do the actual math than how to code it.
We really needed more lectures about Python -- I really struggled with it and not enough help was given. Even just a intro and basics would have helped...
Treat the course like the 3 credit course it is, not a 12 credit course. The amount of work involved including learning a new coding language in our own time was too much. Each homework and project took hours and hours of work not to mention they were all stacked on top of one another. I also think doing projects before homeworks that would then implement the same concepts would've made more sense
Frankly, a lot of things need to change to make this course viable/legitimate. The professor treats this 3 credit course as a 6 credit course. There is an absolute insane workload that required me to work on homework or projects during my other classes simply because I didn't physically have the time otherwise. I will say that we tried to compromise with the professor on amount of work and he did listen, but it dro pped the amount of time necessary to work on his assignments from maybe 18 to 15 per week. The professor also made copious amounts of mistakes in his notes and expected us to have found his mistakes because we read the textbook or found similar note online. I can't stand behind the concept of not being able to trust the notes of my professor. The professor also had impossibly high expectations of his students. Of a roughly 20 person class, only 2 or 3 knew Python. Despite this, he required us to complete entire projects in the language that we knew basically nothing about. He also expected us to understand all the material the second we learned it; as in, here is how you do this basic problem, now do this immensely complex one. A large fault of the professor laid on his empathy with the students. He said he understood that we had other classes, yet still expected us to perform like the only class we were taking was his. I do appreciate that he would always answer questions when possible and kept his officer hours longer than he said. This made the course a pinch better.
Way too much homework and projects. I spent more time per week on this class than all of my other classes combined.
There was way too much work required for this course. I, and many others, were consistently spending 10+ hours a week outside of class working on homework and projects. When confronted about this, the instructor insisted that we just weren't efficient and procrastinating. He seemed to think that the grade we get doesn't really matter, only how much we learn. However, it does matter as it affects our GPA. While the homework and projects were interesting, they required too much work and were often fairly difficult as well. The textbooks were ok, but often did not line up with what was being taught in the course. It would have been helpful if the instructor posted his lecture notes. Sometimes, there are errors in the notes, homeworks or equation sheets (understandable, it's his first time teaching the course). We were not given enough time to finish the midterm.
If coding will be at minimum 20% to 55% of the overall grade in this class, learning how to code should be part of every lesson. We were only given short slide shows with basic coding but expected to teach ourselves how to plot an orbit which took students hours, on top of the normal hw we had. Also, only one person was able to finish the midterm exam on time. Expectations of the students should be high, but not so much that they struggle to complete and do correctly every assignment
First, the instructor of the course needs to have more experience with teaching. His lecturing abilities are very poor, and despite him being helpful if you go to him in person, lectures should be where the information or learning comes from not from when you set up a time to meet personally. I always had to go see Shankar, because his lectures weren't clear, or his assignments.

Spending 20 hours a week on one class, when I have 4 other classes is not only ridiculous for an undergraduate course, but also just plain inappropriate and rude. When students dro p the class because they don't have time to spend on other classes, it's too much. When problems take too long to warrant proper, done-out examples in a 1 hour and 15 minute class, then they are too long to A.) be tested on in that time, and B.) to be given more than 2-3 as homework. Another issue we had was that in addition to learning the material and the hand calculations, we also had to learn a new language for all of the projects. Each project took around 10-12 hours (minimum) and the bulk of that was spent on Stack Overflow using trial and error methods to get these codes to work. I am not a Comp Sci major, I should not be turning in 500+ line, multi function, multi module project programs every two weeks.
It is a very challenging course, while the subject matter is inherently challenging, being taught python ahead of time would have greatly helped.
This class was taught as if it was a 12 credit course. On top of being given ridiculously long homework assignments that each took at least 8 or 9 hours to do, we had concurrent assignments or projects in the class due at similar times as the homework, so I spent at least 15 hours per week on JUST THIS ONE CLASS!!! Not to mention all 5 of my other classes that I had a lot of work for. I routinely found myself putting in little effort to other classes simply because this class required almost all of my time. This class seriously hurt my grades in other classes, my mental stability, and caused me to have a terrible semester. I would not recommend this class to anyone.
Question: You indicated that you were academically prepared to take this course, what prepared you for this class (which prior courses, which topics)?
linear algebra, calculus
Engineering Mechanics Calculus I Calculus II Calculus III Engineering Computations
Calc 3 and Physics
My courses in physics and analytical mechanics, and calculus 3.
Calc 1-3, physics, engineering computations
Dynamics and Physics, partially C Programming
Physics, Calculus, Dynamics, Linear Algebra, Engineering computations While I was very prepared for the academic portion of this class, I was not prepared for the coding required. GW in general does not do a good job of preparing its engineering students to do useful coding, especially in high level languages like Python and Matlab
Physics Calculus
Calculus, Physics
Physics, Multivariable calculus, Linear Algebra
I had taken all the perquisites required for this course, and performed well in them. I have a very good understanding of calculus as well as programming in various languages
I took dynamics class. but doing python was hard for me
Question: You indicated that you were not academically prepared to take this course, please comment on issues with prerequisite courses, or what could have been done differently so that a future student like yourself would be better prepared to take this course?
As MAE majors, we are taught C programming and are required to take a course in it. Then we are switched into python and are not even given the basics on how to use it. Even if we were told to use MATLAB, none of our professors have ever taught us how to use it. They assume we know how to use it, but the one class where were supposed to learn it in did not teach it to us. I can do calculus and arithmetic, but I was not at all prepared for the large portion of this class work that required coding.
As engineers, we have to take C programming, but in this class we have to code in python which uses completely different syntax adn were nver taught before hand how to use or during the class, the complex coding needed to creat e the desired paths
An introduction into Python or even general computing methods would have been nice. It's sad that I had to spend 15-20 Hours a week learning python in a class where learning python isn't even a primary course objective. SEAS uses MATLAB and it is free for all students. Use that in the future.