ENGI 1331 UTA Computer Science Questions Only

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In this document, I provide a list of common questions and answers students have about computer science at the University of Houston. If you would like me to expand on any of these answers, please reach out to me!

The questions that are highlighted are the most important ones.

Computer Science Questions:

1. **"Should I switch my major to computer science?"**
    a. This question depends on what you want to work on, live at, and do in the future. There are benefits to switching to computer science for the right person. Below, I will describe the steps you should take before deciding if computer science is the right major for you.
    b. Think about what you want to do in the future, such as: what you want to work on, where you want to live, and how much money you want to make. Some people want to make $500,000 a year, which is very hard in engineering outside of owning your own business. It is also hard in computer science, but much more accessible than in engineering.
    c. Make sure you are not running from math/science when deciding to switch majors. A computer science major still requires you to take many math and science courses. You will take more pure math classes as a computer science major than you probably would have as an engineering major.
    d. Make sure you enjoy coding in a language outside of MATLAB. Computer science courses are different than what we do in ENGI 1331. The programming language used in almost all computer science classes at UH is C++. If you took AP Computer Science (Java), and enjoyed that, then computer science might be right for you. Otherwise, I would advise you to take COSC 1437 (Introduction to Programming) and see if you like it. Please know that you do not have to take COSC 1336 (Computer Science Programming) as a prerequisite for COSC 1437 if you pass ENGI 1331 (read more about this in question #2). This website: http://www2.cs.uh.edu/~arjun/courses/ds/ is from a sophomore-level course at UH and has all the topics presented in the course listed. Research some of these topics and see if you find them interesting.
    e. Try and work on your own small projects in a language other than MATLAB and see if you enjoy them. Something like a small calculator app would be perfect. There are many ideas online if you look up "computer science beginner projects". Try doing a few of these on your own and see if you like the process.

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2. **"Do I have to take COSC 1336 in order to take COSC 1437?"**
    a. *No*. While it may appear that you do, I know a student who did this and I have asked computer science advisors about this exact question. I do *not* recommend you take COSC 1336 if you have already taken ENGI 1331 because the course is much easier than anything we do in ENGI 1331 and will not help you make a more informed decision about switching majors. Tell an advisor that you have already taken ENGI 1331 and want to take COSC 1437. They will help you sign up for the course. If you are interested in switching your major to computer science, please do *not* waste your time and money by taking COSC 1336.

3. **"What are the best resources for learning about computer science?"**
    a. This will largely depend on the programming language you choose. However, once you understand the fundamentals of computer science, you can program in most any language once you learn the syntax. Below, I'll list some useful resources for learning the basics of some of the most common programming languages. Remember that just like MATLAB, the only way to truly learn a language is by using it. Try to create some of your own projects. I have also listed some useful sites and IDE's (Integrated Development Environment) I recommend.
    b. For C++, I recommend https://www.w3schools.com/cpp/, https://www.youtube.com/watch?v=vLnPwxZdW4Y, and https://www.learncpp.com/ for an introduction to the language. I recommend using Apache NetBeans, Dev-C++, or Replit for your IDE.
    c. For Java, I recommend https://java-programming.mooc.fi/, https://www.w3schools.com/java/, and https://docs.oracle.com/javase/tutorial/java/index.html for an introduction to the language. I recommend using Apache NetBeans or Replit for your IDE.
    d. For Python, I recommend https://www.w3schools.com/python/, https://www.python.org/about/gettingstarted/, and https://www.programiz.com/python-programming. I recommend using PyCharm, IDLE, or Replit for your IDE.
    e. For practicing your given choice of language, I recommend creating your own programs. This is the best way to learn. Outside of that, https://leetcode.com/problemset/all/, https://www.hackerrank.com/, and https://projecteuler.net/archives can be useful for learning the deeper parts of computer science.

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4. **"Where can I learn more about the computer science major?"**
    a. There are several places online to learn about computer science in general and about UH computer science specifically. The computer science advisors host change of major sessions throughout the semester where you can join and learn a little about what to expect in a computer science major. You are *not* obligated to change majors after attending one of these sessions.
    b. This website: https://uh.edu/nsm/computer-science/undergraduate/programs/bs-cs/ has all the information about the courses you will be required to take. I would recommend looking up some of the courses on Google and YouTube and seeing if you find the content interesting.
    c. These YouTube channels make interesting computer science content: https://www.youtube.com/user/Computerphile, https://www.youtube.com/c/LiveOverflow, https://www.youtube.com/c/BenEater, and https://www.youtube.com/c/Reducible. Watching some of the content from these channels will help you decide if you find computer science interesting.
    d. Reddit is also a good resource for reading about computer science. I recommend the following subreddits: https://www.reddit.com/r/csMajors/, https://www.reddit.com/r/cscareerquestions/, https://www.reddit.com/r/computerscience/, and https://www.reddit.com/r/compsci/.

5. **"What is the process for changing my major to computer science?"**
    a. Once you have decided computer science is right for you, the process is fairly easy. First, you will need to attend a change of major session hosted by the computer science advisors. You can schedule one of these meetings on Navigate. I recommend you sign up for one of these as soon as you can once you make the decision to switch. They tend to fill up quickly and they do not host a ton of these every semester. After this session, an advisor will send you a change of major form for you to fill out. You just need to complete this form and email it back to the advisor who sent it to you. Once you send the form back, you are done with the process. The hardest part of switching majors is deciding if you want to switch majors.

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6. **"What are the best clubs for a computer science major?"**
    a. This site: https://uh.edu/nsm/computer-science/connect/student-organizations/ is by far the best place to look. If you had to choose just one, I would choose CougarCS. I also highly recommend: https://uh.campuslabs.com/engage/organization/cougarmathletics. It is a math based club, but is great for any computer science student.

7. **"What is the most useful computer science course for my future career?"**
    a. While many of the courses are important, the two most important are COSC 2436 (Programming and Data Structures) and COSC 3320 (Algorithms and Complexities). Most of what you will do in a computer science job are based on these two courses. Almost all technical interview questions deal with the subjects covered in these courses.

8. **"What programming language is used in UH computer science courses?"**
    a. C++ is exclusively used in almost all courses. There are a few professors who use Java for COSC 2436 (Programming and Data Structures), but most have switched over to C++. The only exception to this is COSC 1336, which uses Python. However, as explained in question #2, I do not recommend you take this course as it is unnecessary.

9. **"Is my experience in MATLAB useful for a computer science major?"**
    a. Yes. While MATLAB is not used much in the computer science courses, the knowledge you gained about programming is useful. For loops, while loops, if statements, and algorithms are all used extensively in computer science courses, so it is good to already have experience with them. I have only directly used MATLAB a couple of times while creating graphs in my computer science courses, but knowing it has been helpful.

10. **"What cities tend to have computer science internships"**
    a. You can find a computer science internship in almost any decently sized city. A few of the most common include: San Francisco, Los Angeles, NYC, Chicago, Houston, Dallas, Austin, Miami, Las Vegas, Denver, Seattle, Portland, Boston, Washington DC, Raleigh, Atlanta, and Phoenix. Remember, there are tons of other places who hire computer science students outside of this small list.