COSC 1435 INTRODUCTION TO PROBLEM SOLVING WITH COMPUTERS I

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Course Description and Purpose

Catalog: An introduction to many computer science topics including: algorithms, problem solving, operating system concepts, computer architecture, and programming languages.

Detailed: A broad introduction to Computer Science. Many important concepts underlying computer science are covered. This includes the algorithmic foundations of computer science and the expression of algorithms as pseudocode. A number of algorithms are examined including sequential search, find greatest, selection sort, and binary search. The time efficiency of algorithms and Big-O classification are discussed. Computer hardware concepts are studied including binary numbers, Boolean logic, gates, and circuits such as compare for equality and addition circuits. The construction of a CPU from basic circuits is examined. Machine language, assembly language and the basic pseudocode/programming language control structures in assembly language are covered. The C++ programming language is an area of emphasis. Operating system concepts, high-level languages, programs written in high-level languages, parsing, networking, and social issues are looked at. The course includes a weekly 2 hour lab that provides experience with the concepts covered in the lectures.

Prerequisites

MATH 1314 or placement beyond MATH 1314

Course Outcomes

Upon completion of this course, students will be able to

- Understand the algorithmic foundations of Computer Science and be able to express algorithms in pseudocode.
- Understand the design of basic searching and sorting algorithms (linear search, binary search, and selection sort).
- Understand the time and space efficiency of algorithms and Big-O notation.
- Understand how binary numbers are represented, basic concepts of Boolean logic and logic gates, and understand the equality and addition circuits.
- Understand the von Neumann model of computer organization.
- Have a basic understanding of machine language and assembly language programming.
- Have a basic understanding of computer system software such as compilers, operating systems, and virtual machines.
- Design and develop basic computer programs using high level programming language (sequence, selection, and iteration structures).
- Be able to design and implement programs that use arrays and functions.

Format

This course will be a mixture of lectures and discussions. The student is expected to actively participate in all class activities. The student is also expected to do outside work on assignments and reading. Additionally, students are to attend a weekly lab session.

Text and References

required texts

Course Outline

The following is a rough outline and is subject to change. See the course website (http://sci.tamucc.edu/~sking/Courses/COSC1435/) for the most up to date information.

- Introduction to Computer Science
- Data Storage
- Algorithms
- Introduction to C++
- Expressions and Interactivity
- Making Decisions
- Looping
- Defining and Calling Functions
- Arrays
- Data Storage
- Programming Languages

Important Dates

- 28 Feb, Exam I
- 04 Apr, Exam II
- 09 May, Final Exam

Student Expectations

- Students are expected to be in attendance, punctual, and prepared for class and labs.
- Assigned readings, as found on the instructor's web page, should be completed before coming to class.
- Know the answers to the 'Practice Problems' and 'Exercises' in the textbook. Most, but not all, quiz questions will be pulled from this material.
- Quizzes will be frequent (normally at least once per week), unannounced, and cover the material assigned in the readings.
- Please ask questions on any material that you do not understand, if I cannot explain it to your satisfaction, please see me during my office hours or labs.
- Demonstrate integrity, maturity, and ethical behavior

Student Evaluation

- Exams (55%): There will be three exams, two midterms worth 15% each, and a comprehensive final worth 25%.
- Programming Assignments (labs) (30%):
- Quizzes, written assignments, and class Participation/Attendance (15%):
- Grade Scale:
  A: 90-100%  B: 80-89%  C: 70-79%  D: 60-69%  F: <60%

Labs

As part of this class, you will have many programming assignments (labs). These labs are all individual efforts. There is a two hour lab session associated with this course. This time is used for supplemental instruction and also for you to work on your programming assignments. Attendance will be taken in these labs, and quizzes may be given.

- Attendance Attendance is required. If you finish the current lab early and have no past due labs, you may leave early.
- Assignments A list of assigned lab work will be available on the course web site and also on Blackboard. These labs are crucial for you to learn the subject matter and also to earn a good grade. Follow the following
Assignments are to be done individually. If two or more people turn in the same assignment, they will all receive a zero for that lab. You are responsible for protecting your work.

Although some labs may be finished during the two hour lab session, in general this will not be the case and you will need to spend time outside of lab time to complete them. Without spending time on the labs you will not learn the material.

Make sure you keep backups of your work. If the dog, or ether, eats your homework, you will receive a zero.

Assignments are to be turned in on time. You can only get an A on a lab that is turned in on-time. Even if you don't finish your lab, you should turn in what you have done for partial credit. A zero on a lab is a very bad thing.

Resubmitting Lab Assignments: Labs may be resubmitted for more credit once with the following rules. The max you can earn on a resubmit is 90. You can only resubmit a lab that was originally turned in on time, with a reasonable amount of effort. The max you can earn is 50% of the points you missed on the original lab (plus the original points).

Course Policies

Assignments are to be done by the student alone. Group solving is not allowed.

No makeup exam without adequate doctor's excuse explaining your absence. Makeup exams will not be the same exam. If for any reason you have a conflict you must see me as soon as you know about the conflict!

Incompletes only with documented reasons in accordance with the university policy.

No late assignments

Turn off cell phones and pagers before class.

Attendance: You are expected to attend each class and be to class and in your seat on time. You will only be counted as in attendance if you arrive to class on time.

Reading: Reading is an important skill that you should already have mastered. You must read material before the lecture and you must read lab assignments in their entirety.

Notes: You should bring pen and paper to class and take adequate notes every day.

Email: You should monitor your university provided email account daily.

Classroom/professional behavior Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor's ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

Disabilities Accommodations: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Driftwood 101.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

Academic Advising: The College of Science and Technology requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. The College's Academic Advising Center is located in Faculty Center 178, and can be reached at 825-6094.

Grade Appeals. As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.