Introduction to Problem Solving with Computers I: COSC 1435  
School of Engineering & Computing Sciences  
Spring 2016

A. COURSE INFORMATION
Course number/section: 1435.002
Class meeting time: TR 02:00-03:15 PM (Lecture)
1435.202: T 03:30-05:20 PM (Lab Section)
1435.302: R 03:30-05:20 PM (Lab Section)
Class location: CI-107
1435.202: CI-226
1435.302: CI-226
Course Website: https://faculty.tamucc.edu/myari/ and https://bb9.tamucc.edu/

B. INSTRUCTOR INFORMATION
Instructor: Dr. Masoud Yari
Office location: EN-317
Office hours: TR 9:00 – 11:00 PM, W 11:00-12:00.
Telephone: 825-3165
E-mail: masoud.yari@tamucc.edu
Appointments: Please email me.

C. COURSE DESCRIPTION
Catalog Course Description
A broad introduction to many computer science topics including: algorithms, problem solving, operating system concepts, computer architecture, and programming languages.

Extended Course Description
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. The course includes a weekly 2-hour lab that provides experience with the concepts covered in the lectures.

D. PREREQUISITES AND COREQUISITES
Prerequisites
MATH 1314 (College Algebra) or placement beyond MATH 1314. Additionally, I expect
you to be able to use a computer for your work. You should be able to do word processing, use email, and use the Internet. You do not need to have any prior programming experience or any prior experience with the UNIX operating system.

Corequisites
None

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)

#2) Starting Out with C++: From Control Structures through Objects, 8th Edition by Tony Gaddis, Addison-Wesley (ISBN: 0-13376939-9)

Optional Textbook(s) or Other References
None

Supplies
Some way to archive your documents (Flash drive, OneDrive, Dropbox, etc)

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

- Understand the algorithmic foundations of Computer Science and be able to express algorithms in pseudocode and flowchart.
- 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.
- 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.

By the end of this course, students should have:
1. An ability to apply knowledge of computing and mathematics appropriate to the program’s student outcomes and to the discipline
2. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
3. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
4. An understanding of professional, ethical, legal, security and social issues and responsibilities
5. An ability to use current techniques, skills, and tools necessary for computing practice
6. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
7. An ability to apply design and development principles in the construction of software systems of varying complexity.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

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.

Please note the dates of the exams on the course schedule below and plan accordingly.

As part of this class, you will have many programming assignments, or labs. These lab assignments are all individual efforts unless otherwise specified. There is a two-hour lab session associated with this course. This time is used for supplemental instruction and for you to work on your programming assignments. Attendance will be monitored in these labs; however, you may leave early if you complete and submit the lab early. Labs may be submitted late, for a maximum of 80% of the total points, up to 48 hours after the original due date. There will be no resubmissions of labs.

You are expected to attend class, participate, and complete the assigned reading. In order to encourage and reward these behaviors, regular quizzes will be given. Know the answers to the “Examples,” “Quick Reviews,” and “Exercises” in the textbooks. Most, but not all, quiz questions will be pulled from this material. There are no make-ups for missed quizzes.

H. MAJOR COURSE REQUIREMENTS AND GRADING

Grade Scale:  A (90-100%)  B (80-89%)  C (70-79%)  D (60-69%)  F (<60%)

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>20</td>
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<tr>
<td>Exam 2</td>
<td>20</td>
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### Programming Assignments (Labs) 30
- Quizzes 5
- Final Exam 25

### I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>DATE (BY DAY OR WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Introduction and Overview</td>
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<td>Read Chapter 1, 2, 3 from Sprankle</td>
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<tr>
<td>Week 2</td>
<td>Introduction to Problem Solving and Programming</td>
<td>Sprankle 1, 2, 3</td>
<td>Read Chapter 4, 5 from Sprankle</td>
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<tr>
<td>Week 3</td>
<td>Problem Solving with the Sequential Logic Structure</td>
<td>Sprankle 4, 5</td>
<td>Read Chapter 6 from Sprankle</td>
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<td>Week 4</td>
<td>Problem Solving with Decisions</td>
<td>Sprankle 6</td>
<td>Read Chapter 7, 8 from Sprankle</td>
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<tr>
<td>Week 5</td>
<td>Problem Solving with Loops Processing Arrays</td>
<td>Sprankle 7, 8</td>
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<tr>
<td>02/25/2016</td>
<td>Exam 1</td>
<td>Sprankle 1, 2, 3, 4, 5, 6, 7, 8</td>
<td>Read Chapter 1, Appendix I from Gaddis</td>
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<td>Week 7</td>
<td>Introduction to Computers and Programming Binary Numbers</td>
<td>Gaddis 1, Appendix 1</td>
<td>Read Chapter 2, 3 from Gaddis</td>
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<td>Week 8</td>
<td>Introduction to C++ Expressions and Interactivity</td>
<td>Gaddis 2, 3</td>
<td>Read Chapter 4 from Gaddis</td>
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<td>Week 9</td>
<td>Making Decisions</td>
<td>Gaddis 4</td>
<td>Read Chapter 5(Part 1) from Gaddis</td>
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<td>Week 10</td>
<td>Looping</td>
<td>Gaddis 5(Part 1)</td>
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<tr>
<td>04/07/2016</td>
<td>Exam 2</td>
<td>Gaddis 1, Appendix I, 2, 3, 4, Gaddis 5(Part 1)</td>
<td>Read Chapter 7 from Gaddis</td>
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<tr>
<td>Week 12</td>
<td>Arrays</td>
<td>Gaddis 7</td>
<td>Read Chapter 5(Part 2) from Gaddis</td>
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<td>Week 13</td>
<td>Files</td>
<td>Gaddis 5(Part 2)</td>
<td>Read Chapter 6 from Gaddis</td>
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<td>Week 14</td>
<td>Functions</td>
<td>Gaddis 6</td>
<td></td>
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<tr>
<td>Week 15</td>
<td>Review</td>
<td>Gaddis 7, 5(Part 2), 6</td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. COURSE POLICIES

Attendance/Tardiness
You are expected to be in attendance, punctual, and prepared for class. If you are more than 5 minutes late to class, you will be counted as tardy. Please make sure that you will never be tardy to any of your classes or accept the consequences.

Late Work and Make-up Exams
NO makeup exams, labs, or quizzes will be allowed unless I have agreed prior to the exam, lab, or quiz time and been provided with official supporting documents.

Extra Credit
There is NO EXTRA CREDIT - don't bother asking.

Cell Phone Use
You are required to turn off your cell phone in class and pay attention to class discussions.

Laptop Use
Use of laptops and other electronic devices is restricted to taking notes.

Food in Class
Eating food in class is Not Allowed.

Missed Exam
Missed exams will be graded as ‘0’.

Participation
Class discussions and information provided in class are considered regular course material; it is your responsibility to take appropriate notes. You are expected to attend lectures and actively participate in class discussions.

Others
Read Section L!!!

K. COLLEGE AND UNIVERSITIY POLICIES

• Academic Integrity (University)
University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- **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.

- **Statement of Civility**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**
  The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, 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 Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage at [http://sci.tamucc.edu/students/GradeAppeal.html](http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  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 (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  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.

  [http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)

- **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

- **Academic Advising**
  The College of Science & Engineering 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. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.
I. **OTHER INFORMATION**

These guidelines are designed to inform scholars of their responsibilities and of the course requirements in order to make this course a positive experience. The instructor is always available for consultation and discussion with students on any aspect of a course and of these general guidelines.

1. Consider yourself as a **scholar** rather than a student. The term “student” may imply some passivity, whereas the term “scholar” implies active participation, understanding and searching. We will use these terms interchangeably with the meaning of “scholar” implied. Osmosis does not work in a learning environment!

2. Further, define yourself as a “thinking explorer”. You are responsible for your education; an instructor can only be a guide and a facilitator. An instructor cannot learn for you. If you come across something that really interests you, explore it further.

3. Your experience at this University should not consist of passing a series of courses to earn a degree. Your experience should rather be a series of activities that will give you an education.

4. Concentrate on “learning to learn”. You will have to be a life-long learner to survive in your chosen career.

5. There is no such thing as a stupid question; there is such a thing as a stupid answer. So ask questions, the instructor is taking all the risks! Ask questions of your instructor and of your fellow scholars. Many times questions are more important than answers.

6. The Internet is a tremendous resource and also a great danger. When you find information on the Internet, you have no idea if it is correct. View such information with caution. But, use the Internet to explore topics that interest you. Do not only prepare for the exam in a course – learn as much as you can on the topics introduced to you by the course material. You are responsible for the extent of your education! **READ MINDFULLY !!!!**

7. In addition to details of the syllabus given in class, the syllabus for the course includes all the chapters of the required textbook/s unless indicated otherwise by the instructor.

8. The final letter grade for the class will be based on the raw composite numerical score obtained from the weighted average of the tests, quizzes, exams, labs, etc. as indicated by the instructor. The raw composite numerical score may be adjusted (curved) based on the highest score, the statistical profile of the scores and other academic standards or other considerations. Generally the letter grade of A is 90% and over of the adjusted score, a B is between 80% and 89% (inclusive) of the adjusted score, a C is between 70% and 79% (inclusive) of the adjusted score, a D is below 70% of the adjusted score and an F is below 65% of the adjusted score. An incomplete (I) will only be given in very unusual circumstances. The University regulations on incomplete grades state: “An incomplete notation may be given to a student who is passing but has not completed a term paper, examination, or other required work for reasons beyond the student’s control other than the lack of time”. Students are expected to take ALL tests, quizzes, exams, etc., and to complete and
hand in all labs and other assignments. There is no provision for “extra credit”. No final grades will be given via the telephone, e-mail, etc.

9. All University rules, regulations and expected student conduct apply to this course. Students are held responsible for the information given in the current Catalog and Student Handbook.

10. All labs, assignments, etc. must be handed in on the assigned due date. Scholars having problems must notify the instructor well before the due date. Marks will be deducted for poor and sloppily presented work.

11. Labs, etc. handed in after the due date may be subject to a penalty of loss of marks. Labs, etc. handed in after the graded labs, etc. have been returned to students will get zero marks but must be handed in to the instructor.

12. Scholars are asked to take special note of the penalties, which the University attaches to Academic Dishonesty. Consult the Student Handbook.

13. All work handed in to the instructor must be the student's own work. Extracts, excerpts, etc. from the work of others must be suitably noted, acknowledged and properly referenced. Any Group Work will be judged in the same way. That is, it is the work of the group and the extracts, excerpts, etc. of others must be acknowledged.

14. All written and graphical work handed in must be presented neatly printed. Student's written work will be judged on written communication skills, critical thinking and problem solving ability.

15. There are NO provisions for making up missed exams except in cases where prior arrangements have been made and agreed to by the instructor.

16. Students must keep their given university e-mail address (i.e. firstname.lastname@islander.tamucc.edu). This will be the means of the instructor communicating with students.

17. All work submitted to the instructor (via e-mail or other means) must be clearly marked with the student’s name and the name and number of the course – this is especially important when work is submitted as an attachment to an e-mail.

18. The instructor reserves the right to make changes to the above with due notice to the students. These changes will be announced to the class (see 16 above) and each student is responsible for keeping herself/himself informed of such changes.

GENERAL DISCLAIMER

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.