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

A. COURSE INFORMATION

Course number/section: COSC 1435.002/022/023
Class meeting time: MW 02:00-03:15PM (Lecture)
                  COSC 1435.202/222 W 03:30-05:20PM (Lab)
                  COSC 1435.302/223 M 03:30-05:20PM (Lab)
Class location: OCNR-115 (Lecture); CI-228 (Lab)
Course Website: http://www.tamucc.edu/wiki/RitaSperry

B. INSTRUCTOR INFORMATION

Instructor: Rita Sperry, PhD
Office location: FC 117
Office hours: Tuesdays 2-4pm and by appointment
Telephone: 825-3158
e-mail: rita.sperry@tamucc.edu

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)
- 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
None

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.

By the end of this course, students should be able to:
1. Understand the algorithmic foundations of Computer Science and be able to express algorithms in pseudocode.
2. Understand the design of basic searching and sorting algorithms (linear search, binary search, and selection sort).
3. Understand the time and space efficiency of algorithms and Big-O notation.
4. Understand how binary numbers are represented, basic concepts of Boolean logic and logic gates, and understand the equality and addition circuits.
5. Understand the von Neumann model of computer organization.
6. Design and develop basic computer programs using high level programming language (sequence, selection, and iteration structures).
7. Be able to design and implement programs that use arrays and functions.

Assessment of objectives will be conducted through lab activities, homework, quizzes and exams.
G. **INSTRUCTIONAL METHODS AND ACTIVITIES**

This is an introductory course. However, this is a difficult course that demands all students attend all classes! Regular completion of all reading, homework, and other outside assignments, are absolutely essential for success in this course.

H. **MAJOR COURSE REQUIREMENTS AND GRADING**

Your course grade will be decided on your performance in the lab activities, homework, quizzes, two mid-term exams, and the final exam. The distribution of points is as follows:

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>15</td>
</tr>
<tr>
<td>Exam 2</td>
<td>15</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20</td>
</tr>
<tr>
<td>Lab Activities</td>
<td>10</td>
</tr>
<tr>
<td>Homework</td>
<td>30</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10</td>
</tr>
</tbody>
</table>

**Grading scale:** A: 100-90, B: 89-80, C: 79-70, D: 69-60, and F: 59-0.

**Homework:** Approximately 10 - 12 homework assignments will be given.

**Exams:** The first exam will be given on September 28, 2016, the second exam will be given on November 2, 2016 during the scheduled class time, and the final exam will be given on December 12, 2016 from 1:45 – 4:45 pm.

I. **COURSE CONTENT/SCHEDULE**

<table>
<thead>
<tr>
<th>DATE (BY DAY OR WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Introduction and Overview</td>
<td></td>
<td>Read Chapter 1, 2, 3 from Sprankle</td>
</tr>
<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>
</tr>
<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>
</tr>
<tr>
<td>Week 4</td>
<td>Problem Solving with the Sequential Logic Structure Problem Solving with Decisions</td>
<td>Sprankle 4, 5, 6</td>
<td>Read Chapter 7, 8 from Sprankle</td>
</tr>
<tr>
<td>Week 5</td>
<td>Problem Solving with Decisions Problem Solving with Loops</td>
<td>Sprankle 6, 7, 8</td>
<td></td>
</tr>
<tr>
<td>Week 6</td>
<td>Processing Arrays</td>
<td>Sprinkle 1, 2, 3, 4, 5, 6, 7, 8</td>
<td>Read Chapter 1, Appendix I from Gaddis</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------</td>
<td>---------------------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>Exam 1</td>
<td>(09/28/2016)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 7</td>
<td>Binary Numbers</td>
<td>Appendix I, Gaddis 1</td>
<td>Read Chapter 2, 3 from Gaddis</td>
</tr>
<tr>
<td></td>
<td>Introduction to</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Computers and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Programming</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 8</td>
<td>Introduction to C++</td>
<td>Gaddis 2, 3</td>
<td>Read Chapter 4 from Gaddis</td>
</tr>
<tr>
<td></td>
<td>Expressions and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interactivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 9</td>
<td>Making Decisions</td>
<td>Gaddis 4</td>
<td>Read Chapter 5 (Part 1) from Gaddis</td>
</tr>
<tr>
<td>Week 10</td>
<td>Looping</td>
<td>Gaddis 5 (Part 1)</td>
<td></td>
</tr>
<tr>
<td>Week 11</td>
<td>Looping</td>
<td>Gaddis 1, Appendix I, 2, 3, 4, 5</td>
<td>Read Chapter 7 from Gaddis</td>
</tr>
<tr>
<td></td>
<td>Exam 2 (11/03/2016)</td>
<td>(Part 1)</td>
<td></td>
</tr>
<tr>
<td>Week 12</td>
<td>Arrays</td>
<td>Gaddis 7</td>
<td>Read Chapter 5 (Part 2) from Gaddis</td>
</tr>
<tr>
<td>Week 13</td>
<td>Files</td>
<td>Gaddis 5 (Part 2)</td>
<td>Read Chapter 6 from Gaddis</td>
</tr>
<tr>
<td>Week 14</td>
<td>Files (Monday only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 15</td>
<td>Functions</td>
<td>Gaddis 6</td>
<td></td>
</tr>
<tr>
<td>Week 16</td>
<td>Review</td>
<td>Gaddis 7, 5 (Part 2), 6</td>
<td></td>
</tr>
</tbody>
</table>

**Final Exam** on Monday, December 12, 2016 from 1:45 PM - 4:15 PM.

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

**Course Syllabus:** We will meet for lecture on Mondays and Wednesdays, when new material will be presented. We will follow the text generally, but non-text material may also be included in the lectures. The assignments and exams will be given during the class hours. You are responsible for all the material presented during the lecture. We will meet for the lab on Mondays for COSC 1435.302 section and on Wednesdays for COSC 1435.202 section.

**Exams:** Exams will cover all lecture and reading material discussed in the class. Exams must be taken on the hour they are scheduled.

**Missed Exam:** In the event, if you cannot attend the class to take the exam due to some emergency or some unavoidable situation (such as serious illness, death in the family, participation in university sports, religious observations, and so on) you must notify me...
as soon as possible before the exam and also you must validate your absence by providing me a document (e.g., with a letter from your doctor). Once your cause is validated a make-up exam will be given.

**Homework:** Assignments will significantly build on the material from the lectures. They will be posted on the course web page or hard copies are handed out in the class during the lecture or lab sessions. Please refer to the handout on programming assignments for complete details on submission requirements. (Details decided per assignment). All the assignments are due at the beginning of the class on the due date. If the student is absent on the assignment due date, it is the student's responsibility to see to it that the assignment is submitted on the designated date. An assignment that is turned in after the class on the due date is considered one day late. There is a penalty for late submissions. 10% penalty for 1 day late, 25% penalty for 2-3 days late, 50% penalty for 4-5 days late, and 100% penalty (i.e. no credit) if submitted after 5 days. If you have not completed your assignment by the due date, you should submit the work you have done for partial credit. No work will be accepted once the graded work has been returned or the solution has been disclosed to the class, except for unusual circumstances which the instructor feels reasonable. **Be sure to backup copies of all your programs. Note that any kind of hardware or software failure or machine unavailability in the lab does not merit an extension on the assignment.** Diskettes upon which major examinations, assignments, projects or papers submitted may be retained by the instructor as a permanent record of the student's work.

**Grading Error:** All questions concerning a test score or grading of a returned test or assignment must be resolved within one week. It is always a good idea to keep all of your work until the end of the semester. In case of any recording errors or doubts, you may produce them for correction or verification.

**Extra Credit:** There is no EXTRA CREDIT

**Academic Honesty Policy:** You are expected to avoid all forms of academic dishonesty as defined in Catalog. In addition, students are expected to behave in an ethical manner in all class activities. If you feel uncertain about a particular activity, please speak to me BEFORE problems arise. Ethical behavior is a requirement for passing this course. All work submitted for grading must be the student's own work. Plagiarism will result in a score of 0 (zero) for the work or dismissal from the course and the Dean of Students office will be notified. No copying from another student's work, of any class, is allowed. It is the student's duty to allow no one to copy his or her work. Anyone found cheating and/or copying, in the exams or assignments, in the instructor's opinion, will receive an automatic F for the course.

**Collaboration:** There is no collaboration allowed on homework assignments.

**Attendance:** You must attend all classes and labs. While in class or lab attendance will not directly affect the grade, you are responsible for any materials covered or handed out or announcements made for the tests and assignments in your absence. Records of your
attendance will be maintained and reported to the university. Students found missing classes without the instructor's permission will be automatically withdrawn from the course.

**Absence from class:** Students are responsible for all materials covered in class and assigned. Should a student be absent from class, it is his/her responsibility to get the notes, etc. for that missed class. More important, should there be assignments, it is the student responsibility to obtain such assignments. No excuse will be accepted for assignments not turned in because the student was absent when it was due.

**Cell Phone Use:** Cell phones and pagers must be turned off during class. First violation receives a warning. All succeeding violations result in a ten points deduction on the last exam. Any violation during a quiz or exam results in a ten percent deduction off the corresponding paper. No warnings for quizzes or exams.

**Laptop Use**
Laptops, Tablets cannot be used in the class.

**Food in Class**
No food in the class or labs.

**Student Security Statement:** Please read the [Student Security Statement](#).

K. **COLLEGE AND UNIVERSITY 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 be 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.tamu-cc.edu/academics/calendar/](http://www.tamu-cc.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.tamu-cc.edu/provost/university_rules/index.html](http://www.tamu-cc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage at [http://sci.tamu-cc.edu/students/GradeAppeal.html](http://sci.tamu-cc.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/

- **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.

L. **OTHER INFORMATION**

- **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.

**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.