# INTRODUCTION TO PROGRAMMING AND PROBLEM SOLVING

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## INTRODUCTION TO COURSE AND INSTRUCTOR

### SYLLABUS FOR INTRODUCTION TO PROGRAMMING AND PROBLEM SOLVING (CSCI 40)

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<th>Fall, 2016</th>
<th>Computer Science, California State University, Fresno</th>
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<tr>
<td>Introduction to Programming and Problem Solving</td>
<td>Dr. David Ruby</td>
</tr>
<tr>
<td>Units: 4</td>
<td>Office: Science II - 273</td>
</tr>
<tr>
<td>Time: 9:00 – 9:50am</td>
<td>E-Mail: <a href="mailto:druby@csufresno.edu">druby@csufresno.edu</a></td>
</tr>
<tr>
<td>Location: Science II - 309</td>
<td>Telephone: 278-4312</td>
</tr>
<tr>
<td>Website: NA</td>
<td>Office Hours: TBD</td>
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Course description: Introduction to problem solving, algorithm development, procedural and data abstraction; program design, coding, debugging, testing, and documentation; a high-level programming language.

Prerequisites for the course: Students must take the ELM exam; students who do not pass the exam must record a grade of C or better in a college-taught intermediate algebra course; trigonometry.

REQUIRED COURSE MATERIALS

Software requirements: This course is taught in C++. Students should know how to use one of the following software:
- COMMAND LINE: UNIX/LINUX/MAC G++
- IDE: DEV C++, MAC, MICROSOFT VISUAL C++, ETC
- NITROUS.IO: ONLINE CODING ENVIRONMENT

Resources:
2. Blackboard.csufresno.edu will be used for announcements, discussion.
   (https://bookshelf.vitalsource.com/books/9781284084870/epubcfi/6/2/1/4/1/2/0:0)
   (https://bookshelf.vitalsource.com/books/9781284084870/epubcfi/6/2!/4/2/2@0:49.9)

COURSE SPECIFICS
Contents: This course will embrace two parts. Firstly, we will introduce the fundamental elements of C++ programming including variables, arrays, input/output, characters, arithmetic operators and conditional expressions, followed by control statements, loops, and functions, then by pointers, input/output, and structures. Then, we focus on how to solve some interesting and important problems using programming techniques such as iteration, recursion, sorting, and searching.

Course Goals: By taking this course, students should be able to
- Write programs to design and implement solutions for scientific computational problems in C++.
- Write programs to implement various algorithms.
- Write programs to process and extract information from a given string or file.
• Write programs to design new data structures (especially with structure and pointer) for certain applications.
• Obtain a solid background for CSci 41 (Introduction to Data Structures) and many other more advanced courses.
• Obtain a solid background for other advanced programming languages such as Java.

**Learning Outcomes:** Students will learn the techniques of programming in C++ and solutions for various important problems. Students will obtain the necessary knowledge, solutions, and programming skills in topics as follows:

• Program structure, programming environment, and how to edit, debug, and run a C++ program in various systems.
• Basic program components such as variables, expressions, control statements, standard input/output statements, etc.
• Iterative statement using for/while/do-while loops and recursion. Correspondence between for loops and while loops. Advantages and disadvantages of recursion and iterative approaches.
• Declaration, implementation, and use of functions. How to use functions to improve the readability and reusability of programs.
• Initialization and manipulation of arrays in a program. How to use array and iteration together.
• Pointer, reference and dereference operations, relationship between pointer and array elements, array of pointers, and dynamic memory allocation.
• Declaration and manipulation of strings and the implementation of string functions.
• Declaration and use of basic and complex structures, pointer and structures, basics of linked list data structures, and array of structures.
• Utilization of standard template library (STL) classes such as vector, string.
• Input and output with text files.
• Solutions of many popular problems such as finding average/summation/median of a list, reversing a string, binary sort, finding number of appearance of a specific character in a string, etc.

**Common mistakes that should be avoided:**

• Missing many lectures.
• Missing many assignments.
• Not spending time outside of the lecture to study class materials.
• Focusing on memorizing instead of understanding and practicing.

**Attendance:** Attending the lectures and labs is required. If you are absent from lectures and/or labs, it is your responsibility to check on announcements made while you were away by checking the blackboard.

**Projects:**

• *Programming Projects* are critical for the success of this class;
• You must submit each project before the announced deadline.
Quizzes:
- Quizzes are used to help test understanding of material.
- Please review related materials before starting the quiz.
- Total from quizzes will be worth 5% of overall grade.

Exams:
- Two midterm exams and one final exam will be arranged.
- The final exam will be comprehensive.
- There will be one review class immediately before each exam.
- The style/format of exams will be confirmed in the review class.
- Make-up exam is not allowed. Exceptions are permitted only in special cases and are handled on a case by case basis.

Grading:
- A: 85-100; B: 70-84; C: 55-69; D: 40-54; F: <40

<table>
<thead>
<tr>
<th>Course Item</th>
<th>Percentage</th>
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<tr>
<td>In-Class Participation</td>
<td>3%</td>
</tr>
<tr>
<td>Zyante Participation Activities</td>
<td>5%</td>
</tr>
<tr>
<td>Zyante Challenge Activities</td>
<td>5%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>5%</td>
</tr>
<tr>
<td>Programming Projects</td>
<td>16%</td>
</tr>
<tr>
<td>Midterm exam I (in Classroom)</td>
<td>10%</td>
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<tr>
<td>Midterm exam II (in Classroom)</td>
<td>16%</td>
</tr>
<tr>
<td>Final exam (in Classroom)</td>
<td>40%</td>
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Note: This syllabus and schedule are subject to change in the event of extenuating circumstances. If you are absent from class, it is your responsibility to check on announcements made while you were absent.

DISCOVERe COURSE
This is a DISCOVERe course that incorporates the use of tablet technology both in and out of class to promote active learning. You are expected to use your tablet for course related activities, including reading, note-taking, group discussions, polls, presentations, exams, and other classroom activities. Whether you are purchasing a tablet, leasing a tablet or using one you owned prior to taking this class, be sure you check this list of tablets approved for use in the DISCOVERe program to make sure that you have a tablet
that meets the minimum specifications for the course. Note that in this course a smartphone is not an acceptable substitute for a tablet.

Your tablet must have the following required or core apps for this course:

- Suggested:
  - Blackboard
  - Google Classroom
  - Google Drive
  - Google Docs
  - Google Slides
  - Google Spreadsheets
  - Adobe Reader

Please take care of and keep your tablet safe. It is your responsibility to maintain your tablet throughout the course to fulfill the course requirements. You would be responsible to replace the tablet should it become lost or is stolen.

- Purchasing a warranty is suggested to offset the cost of a broken tablet. If the tablet is not covered under warranty, you would be responsible to replace the tablet if it is damaged beyond use.
- Jailbreaking or other modifications can void your warranty and cause significant performance problems. You are strongly discouraged from jailbreaking or performing any other unsupported modifications to your tablet.

Fresno State is not responsible for maintenance, replacement, or repair of your tablet.

Your instructor is not responsible for providing technical assistance with your tablet or apps. If you have questions about the performance of your tablet, you should make use of the following resources:

Walk-in assistance: DISCOVERe Hub (HML lower level)

Email: discoverehub@csufresno.edu

Phone: 559.278.1812

Web: http://www.fresnostate.edu/president/discovere/hub/

It is your responsibility to charge your tablet and make sure it’s operational prior to each class. Most classes do not have sufficient outlets to charge your tablet during class. You must come to class with a fully charged tablet to ensure that you are able to complete all in-class activities.
SUPPLEMENTAL INSTRUCTION (SI):
Supplemental Instruction is provided for all students who want to improve their understanding of the material taught in this course. SI sessions are led by a student who has already mastered the course material and has been trained to facilitate group sessions where students can meet to compare class notes, review and discuss important concepts, develop strategies for studying, and prepare for exams. The SI leader attends this class and communicates regularly with the instructor to ensure that accurate information is given. Attendance at SI sessions is free and voluntary for any student enrolled in this course. Students may attend as many times as they choose. A session schedule will be announced in the first few weeks of class. Need more information? Check out FRESNO STATE SI VIDEO: http://youtu.be/yTLGt5TLOUI

COURSE POLICIES & SAFETY ISSUES

Class Policy:
- Questions and discussions are welcomed and encouraged.
- Cheating and dishonesty will be heavily punished according to university policy.

Lab Policy:
- You should maximize your utilization of additional resources outside of lab, e.g., personal laptop and library computers, to finish the assignments.
- No gaming or instant messaging in labs.
- Do not work on assignments of other classes during the designated lab time.

UNIVERSITY POLICIES AND SERVICES

Students with Disabilities: Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Services to Students with Disabilities in the Henry Madden Library, Room 1202 (278-2811).

Honor Code: “Members of the Fresno State academic community adhere to principles of academic integrity and mutual respect while engaged in university work and related activities.” You should:

a) understand or seek clarification about expectations for academic integrity in this course (including no cheating, plagiarism and inappropriate collaboration)

b) neither give nor receive unauthorized aid on examinations or other course work that is used by the instructor as the basis of grading.

c) take responsibility to monitor academic dishonesty in any form and to report it to the instructor or other appropriate official for action.
**Cheating and Plagiarism:** Cheating is the actual or attempted practice of fraudulent or deceptive acts for the purpose of improving one's grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term 'cheating' not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means. Plagiarism is a specific form of cheating which consists of the misuse of the published and/or unpublished works of others by misrepresenting the material (i.e., their intellectual property) so used as one's own work. Penalties for cheating and plagiarism range from a 0 or F on a particular assignment, through an F for the course, to expulsion from the university. For more information on the University's policy regarding cheating and plagiarism, refer to the Class Schedule (Legal Notices on Cheating and Plagiarism) or the University Catalog (Policies and Regulations).

**Computers:** "At California State University, Fresno, computers and communications links to remote resources are recognized as being integral to the education and research experience. Every student is required to have his/her own computer or have other personal access to a workstation (including a modem and a printer) with all the recommended software. The minimum and recommended standards for the workstations and software, which may vary by academic major, are updated periodically and are available from Information Technology Services or the University Bookstore [http://www.kennelbookstore.com](http://www.kennelbookstore.com). In the curriculum and class assignments, students are presumed to have 24-hour access to a computer workstation and the necessary communication links to the University's information resources."

**Disruptive Classroom Behavior:** "The classroom is a special environment in which students and faculty come together to promote learning and growth. It is essential to this learning environment that respect for the rights of others seeking to learn, respect for the professionalism of the instructor, and the general goals of academic freedom are maintained. Differences of viewpoint or concerns should be expressed in terms which are supportive of the learning process, creating an environment in which students and faculty may learn to reason with clarity and compassion, to share of themselves without losing their identities, and to develop an understanding of the community in which they live. Student conduct which disrupts the learning process shall not be tolerated and may lead to disciplinary action and/or removal from class."

**Copyright Policy:** Copyright laws and fair use policies protect the rights of those who have produced the material. The copy in this course has been provided for private study, scholarship, or research. Other uses may require permission from the copyright holder. The user of this work is responsible for adhering to copyright law of the U.S. (Title 17, U.S. Code). To help you familiarize yourself with copyright and fair use policies, the
University encourages you to visit its Copyright Web Page
https://library.fresnostate.edu/info/copyright-policy

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For free tutoring on campus, contact the Learning Center (http://fresnostate.edu/studentaffairs/lrc) in the Collection Level (basement level) of the Henry Madden Library. You can reach them by phone at 559.278.3052.

Our campus has developed SupportNet (http://fresnostate.edu/studentaffairs/lrc/supportnet) to connect students with specific campus resources promoting academic success. Students may be referred to it if you believe they need the services provided by SupportNet to succeed in your course.

Subject to Change Statement
This syllabus and schedule are subject to change in the event of extenuating circumstances.