NORTHERN ARIZONA UNIVERSITY

School of Informatics, Computing, and Cyber Systems

# CS 136 **Computer Science II** Syllabus

| Term | Class No. | Section | Units | Days & Times | Room | Mode |
|---|---|---|---|---|---|---|
| Spring 2020 | 1847 | 001 | 3 | TuTh 2:20 PM – 3:35 PM | 069-218 | Face-to-face |
| Spring 2020 | 3756 | 002 | 3 | TuTh 4:00 PM – 5:30 PM | 069-218 | Face-to-face |

## Enrollment Requirements

Prerequisite: MAT 136 or MAT 136H or Math Placement Test Results (ALEKS/MATHA 65+; MATHC 65+; PLACE 70+)
Corequisite: CS 136L

## Course Website

http://bblearn.nau.edu

## Instructor(s)

Mr. R. David Beverly and Dr. Michael Leverington
Email: Use BBLearn "Course Email" exclusively
Office Hours:
Mr. Beverly: EGR (69) #212 M/W, 2:00 pm – 3:00 pm; T/Th, 9:30 am – 11:00 am
Dr. Leverington: EGR (69) #243 M/W, 10:00 am – 12:00 pm & 1:00 pm – 3:00 pm; T/Th, 1:00 pm – 2:00 pm

## Description

Intermediate computer science, emphasizing algorithm design, object-oriented programming, and data structures. Letter grade only. Course fee required

## Course Purpose

Upon successful completion of this course, students will have gained an enhanced understanding of fundamental programming, algorithmic implementation, and some basic programming language concepts through hands-on application. Students will also be competent in the use of debugging, test development, and the conduct of individual and pair programming.

## Course Student Learning Outcomes

Upon successful completion of this course, students will be able to demonstrate the following competencies:

LO1. An ability to program alone and with a team
a. Complete projects alone or in a pair programming environment.
This outcome supports the BSCS ABET Student Outcomes 2 and 6.

LO2. An ability to read and write code proficiently in the Java programming language
a. Write non-trivial syntactically correct programs in the Java language;
b. Read and write Java programs utilizing exceptions;
c. Read, analyze, and explain the operations of a given Java program
This outcome supports BSCS ABET Student Outcomes 2 and 6.

LO3. An ability to solve complex problems with object-oriented programming and design methodologies
a. Write programs using existing interfaces;
b. Write classes designed for inheritance;
c. Write a full unit testing suite for an application;
d. Write programs employing object-oriented libraries, such as the Java Swing library
This outcome supports BSCS ABET Student Outcomes 2 and 6.

LO4. An ability to communicate design choices using UML and object-oriented principles
a. Evaluate and design software systems using object-oriented principles of data abstraction, minimal coupling, high cohesion, and extensibility
b. Use UML and appropriate terminology to understand, convey, or discuss a detailed software system design, in terms of data abstraction, coupling, and modularity.
This outcome supports BSCS ABET Student Outcomes 2 and 6.

## Assignments / Assessments of Course Student Learning Outcomes

Learning outcomes are assessed through a variety of means:
At least ten progressively more challenging individual programming projects will support LO1 a, LO2 a, b, c, LO3 a, b, d, and LO4 a, b
Three examinations, two mid-term examinations and a final examination will support LO2 a, b, c, LO3 a, and LO4 a assessment
A closed 90-minute laboratory is associated with this course which supports several of the learning outcomes, including the paired programming requirement, but those will be indicated in that course syllabus

## Grading System

A weighted sum of assessment components is used to determine your final grade in the course:

- Class activities, including clicker questions and occasional written quizzes: **15%**
- Programming projects: **20%**
- Mid Term I: **15%**
- Mid Term II: **15%**
- Final Exam: **35%**

Grades will be assigned using the weighted sum described above using this scale:
**A** ≥ 90%, **B** ≥ 80%, **C** ≥ 70%, **D** ≥ 60%, **F** < 60%.

Each graded item will be scored on a simple rubric, scores will be added and normalized to a percentage, and then multiplied by the appropriate weight specified above. Letter grades are earned as follows: A: 90% and above, B: 80% and above, C: 70% and above, D: 60% and above, F: below 60%. Per NAU policy, there are no plusses or minuses awarded, and grades are not normally rounded up or down.

Grading will be conducted, and grades posted as expeditiously as possible so students can be regularly updated on their current score. Students are expected to contact the Instructor if any grades do not seem correct; identified and legitimate grading issues will be corrected as soon as possible. However, grades posted and not challenged for three weeks after they are posted will be considered correct, and are unlikely to be subject to change.

## Readings and Materials

Students will be required to purchase a textbook for this class:

*Big Java: Early Objects* by Cay Horstmann (ISBN: 9781119499534)

Students must also purchase an iClicker 2 Student Remote for class activities. This is likely to be used on the first day of class and throughout the course.

## Class Outline and Tentative Schedule

The course topics and a tentative schedule serve as an outline for the class:

| | | Tuesday | | Thursday | Reading |
|---|---|---|---|---|---|
| **Week 1** | **1/14** | Course introduction | **1/16** | Program sequence | Chapter 1 |
| **Week 2** | **1/21** | Java programming, using IDE | **1/23** | continued... | Chapter 4.1, 4.2, 4.4, 4.5, JOptionPane reference |
| **Week 3** | **1/28** | Math operations, GUI I/O | **1/30** | continued... | Chapter 2.1-2.3, 3 |
| **Week 4** | **2/4** | Method creation, use | **2/6** | continued... | Chapter 5 |
| **Week 5** | **2/11** | Introduction to branching | **2/13** | continued... | Review chapters to date |
| **Week 6** | **2/18** | Prep for Mid-Term I | **2/20** | Mid-Term I Exam | Chapter5 (continued), Chapter 6 (after exam) |
| **Week 7** | **2/25** | Branching continued, Boolean methods; introduction to iteration | **2/27** | continued... | Chapter 7, but not 7.2 (we won't be using enhanced for loops) |
| **Week 8** | **3/3** | Use of one/two dimensional arrays, separate classes | **3/5** | continued... | Chapter 11 |
| **Week 9** | **3/10** | File I/O, separated classes | **3/12** | continued... | Chapter 7, 11 |
| **Week 10** | **3/24** | Data storage, separated classes, File I/O | **3/26** | continued... | Review chapters to date |
| **Week 11** | **3/31** | Prep for Mid-Term II | **4/2** | Mid-Term II Exam | Chapter 15.2, 16.1, 16.3 (after exam) |
| **Week 12** | **4/7** | Introduction to linked lists | **4/9** | continued... | Chapter 8, 9 |

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|---|---|---|---|---|---|
| **Week 13** | **4/14** | Class inheritance, UML | **4/16** | continued... | Chapter 10.1-10.3, 10.5 |
| **Week 14** | **4/21** | Use of interfaces | **4/23** | continued... | Chapter 6.10 (review) |
| **Week 15** | **4/28** | Testing, debugging | **4/30** | continued... | |
| **Week 16** | **5/7**<br>**5/6** | Final Exam, Section 001<br>Final Exam, Section 002 | | 12:30 pm – 2:30 pm<br>3:00 pm – 5:00 pm | |

## Course Policies

The following policies will apply to this course:

**Attendance.** Students are expected to attend and be on time for every class. There will be class interaction every day, and possible clicker/quizzes almost every day. Miss a day, miss a lot!

**Class Interaction**. As stated previously in this document, there will be class activities almost every day. There will be weekly programming project assignments focused on the topic and objectives given the previous week. Students must attend to all activities since most or all of them will likely be graded.

**Late work submission.** As a general rule, late work will not be accepted. However, if the Instructor is advised ahead of time that a student will miss some course component for a legitimate and verifiable reason, consideration will be given to extending a deadline for the individual student.

**Electronic Devices.** It is expected that all students will silence their phones or other noise-making devices during class time. During the examination components, no electronic devices may be visible to the Instructor or used by the student. Students may keep a mobile phone or other device in their pocket but may not use any electronic device while in the testing environment. **Note that failure to follow this requirement is likely to result in a zero on the examination.**

**Blackboard Learn.** It is expected that all students have access to Blackboard Learn on the first day of class. All students are expected to check on Blackboard Learn for news or updates, posted grades, emails, announcements, and so on, every week day. It is a really good idea to check it once or twice on weekends as well.

**Computer Access.** The programming projects will require access to a Java programming environment. The Instructor will be using an Eclipse IDE and various text editors. You must use a generally accepted programming IDE for your work, and the Eclipse IDE is recommended for this course.

**Working with Others.** Unless otherwise instructed, students may work together as needed for any and all classroom assignments. For the programming projects, students may work together on any part of the design and development phases up to the point of writing code. Note that in the Academic Integrity references below, your code must be unique; once you have worked out some programming solutions, you must go to your own editor and write the code your own way. Students may also ask questions or share information on the Blackboard Learn Discussion Board within reason.

**Sharing Work.** All rights, regulations, and conditions concerning academic honesty and plagiarism, as they appear in the current University catalog and are described below, will be upheld in this course. In addition to the stated University standards, any student-contributed artifact found to have more in common with any other source (e.g., one or more fellow students, any online reference, any exams, programs, or materials provided or used in previous classes or semesters, etc.) than is considered reasonable or acceptable by the course Instructor(s) will be deemed to be academic dishonesty. Note that, like the University policy, this definition includes the person who provided the material(s) in question. Any student who has demonstrated academic dishonesty in this course will receive a minimum academic penalty of: 1) failure of the assignment or assessment artifact (i.e., assigned grade will be zero), and 2) an Academic Integrity Violation Form indicating the academic integrity breach and the associated sanction will be forwarded to the College of Engineering, Forestry, and Natural Resources to be placed in the student's permanent file. Depending on the egregiousness of the activity and the discretion of the Instructor(s), sanctions beyond these minimums may also be applied.

Spring 2020 Note: The new academic integrity rules include a component related to being in possession of previous examinations: "Possessing, using, or circulating previously administered examinations, unless authorized by the appropriate faculty member". For purposes of this course, this means that if you are found to be in possession of ANY examination other than 1) your own, and 2) from this semester's course, you will be found in violation of NAU's Academic Integrity policy (and get a letter written to the Dean).

**Using iClickers.** In addition to any other integrity issues or conditions, since this course uses a personal response system for daily activities, any attempt to misrepresent student attendance and/or interaction with the personal response system will most likely result in the student(s) **failure of the course**. Such attempts might include, but are not limited to, one student representing another student with her/his own device or with another person's device, any student attempting to misuse the system in such a way that the student gains undue credit, any student reporting failure of the system to gain undue credit, etc. **Important note: If one student attempts to represent any other student(s), failure of both (or all) students will be the most likely result.**

**NAU Athletics.** If you are involved with any university-sponsored athletic activities that will have an impact on your course continuity, you must provide your Instructor with a letter from your coach and/or the NAU Athletic Department as soon as possible, but no later than the end of the second week of classes. This should include the official schedule of your activities which will impact your attendance throughout the semester. You must also advise your Instructor at least one week in advance of any absences related to the athletic activities

**Illness.** If you are sick or have a health-related reason for not continuing with course activities, let your Instructor know as soon as you are aware of the problem. You can do this via Blackboard Learn Course Email to the Instructor. As stated previously in this document, as long as the issue is legitimate and verifiable, advance notice to the Instructor may lead to extension of a homework, laboratory, or other deadline.

**Course/Policy Modification.** The Instructor reserves the right to add to, and/or modify any of the policies previously specified in this document as needed to maintain an appropriate and effective educational atmosphere in the classroom. In the case that this occurs, all students will be notified in advance of implementation of the new and/or modified policy.

**Resources for Student Success.** Successful university students take advantage of services and resources designed to boost learning and achievement.

- ResourceConnect - your online central navigation point for all NAU student resources
- University College Services – a full listing University College services
- Supplemental Instruction - attend these course-specific review sessions whenever offered; proven to reduce D's and F's
- Student Learning Centers - free drop-in, online, and individual tutoring appointments for math, writing, and over 100 courses; available Monday through Friday
- Action Center - messages to keep you academically on track – when you get a message take action!

Personal Safety and Security. The NAU Police Department offers safety and security information at this website. In addition, here are some brief tips to maintaining your own safety and security:

- Make personal safety your number one priority. Awareness, Avoidance and Risk Reduction are the best ways to avoid bad situations.
- Travel in groups of two or more and always travel in well-lit, heavily traveled areas. Advocate for, and protect your friends who are having difficulties. Don't look away.
- Tell someone where you are going and when you will return. You may also mention the path or transportation you will be using.
- Carry a whistle or noise maker. This can serve as a reminder to exercise caution, and can alert someone in the area that you need help. Your noisemaker and your car keys should always be in your hand as you walk to your car or facility access door.
- Be alert! Look around you; be aware of who is on the street and in the area. Make it difficult for anyone to take you by surprise. If listening to music, keep the volume low so you can hear what is going on around you.
- Never walk alone on campus at night. If you know you are going to be working late, plan ahead as to how you will get to your vehicle or residence safely.
- Use the campus shuttles to get around but again remember to travel in groups if you are getting off the shuttles in isolated locations.

# Appendix A. UNIVERSITY POLICY STATEMENTS

## ACADEMIC INTEGRITY

NAU expects every student to firmly adhere to a strong ethical code of academic integrity in all their scholarly pursuits. The primary attributes of academic integrity are honesty, trustworthiness, fairness, and responsibility. As a student, you are expected to submit original work while giving proper credit to other people's ideas or contributions. Acting with academic integrity means completing your assignments independently while truthfully acknowledging all sources of information, or collaboration with others when appropriate. When you submit your work, you are implicitly declaring that the work is your own. Academic integrity is expected not only during formal coursework, but in all your relationships or interactions that are connected to the educational enterprise. All forms of academic deceit such as plagiarism, cheating, collusion, falsification or fabrication of results or records, permitting your work to be submitted by another, or inappropriately recycling your own work from one class to another, constitute academic misconduct that may result in serious disciplinary consequences. All students and faculty members are responsible for reporting suspected instances of academic misconduct. All students are encouraged to complete NAU's online academic integrity workshop available in the E-Learning Center and should review the full academic integrity policy available at https://policy.nau.edu/policy/policy.aspx?num=100601.

## COURSE TIME COMMITMENT

Pursuant to Arizona Board of Regents guidance (Academic Credit Policy 2-224), for every unit of credit, a student should expect, on average, to do a minimum of three hours of work per week, including but not limited to class time, preparation, homework, and studying.

## DISRUPTIVE BEHAVIOR

Membership in NAU's academic community entails a special obligation to maintain class environments that are conductive to learning, whether instruction is taking place in the classroom, a laboratory or clinical setting, during course-related fieldwork, or online. Students have the obligation to engage in the educational process in a manner that does not breach the peace, interfere with normal class activities, or violate the rights of others. Instructors have the authority and responsibility to address disruptive behavior that interferes with student learning, which can include the involuntary withdrawal of a student from a course with a grade of "W". For additional information, see NAU's disruptive behavior policy at https://nau.edu/university-policy-library/disruptive-behavior.

## NONDISCRIMINATION AND ANTI-HARASSMENT

NAU prohibits discrimination and harassment based on sex, gender, gender identity, race, color, age, national origin, religion, sexual orientation, disability, or veteran status. Due to potentially unethical consequences, certain consensual amorous or sexual relationships between faculty and students are also prohibited. The Equity and Access Office (EAO) responds to complaints regarding discrimination and harassment that fall under NAU's Safe Working and Learning Environment (SWALE) policy. EAO also assists with religious accommodations. For additional information about SWALE or to file a complaint, contact EAO located in Old Main (building 10), Room 113, PO Box 4083, Flagstaff, AZ 86011, or by phone at 928-523-3312 (TTY: 928-523-1006), fax at 928-523-9977, email at equityandaccess@nau.edu, or via the EAO website at https://nau.edu/equity-and-access.

## TITLE IX

Title IX is the primary federal law that prohibits discrimination on the basis of sex or gender in educational programs or activities. Sex discrimination for this purpose includes sexual harassment, sexual assault or relationship violence, and stalking (including cyber-stalking). Title IX requires that universities appoint a "Title IX Coordinator" to monitor the institution's compliance with this important civil rights law. NAU's Title IX Coordinator is Pamela Heinonen, Director of the Equity and Access Office located in Old Main (building 10), Room 113, PO Box 4083, Flagstaff, AZ 86011. The Title IX Coordinator is available to meet with any student to discuss any Title IX issue or concern. You may contact the Title IX Coordinator by phone at 928-523-3312 (TTY: 928-523-1006), by fax at 928-523-9977, or by email at pamela.heinonen@nau.edu. In furtherance of its Title IX obligations, NAU will promptly investigate and equitably resolve all reports of sex or gender-based discrimination, harassment, or sexual misconduct and will eliminate any hostile environment as defined by law. Additional important information about Title IX and related student resources, including how to request immediate help or confidential support following an act of sexual violence, is available at http://nau.edu/equity-and-access/title-ix.

## ACCESSIBILITY

Professional disability specialists are available at Disability Resources to facilitate a range of academic support services and accommodations for students with disabilities. If you have a documented disability, you can request assistance by contacting Disability Resources at 928-523-8773 (voice), 928-523-6906 (TTY), 928-523-8747 (fax), or dr@nau.edu (e-mail). Once eligibility has been determined, students register with Disability Resources every semester to activate their approved accommodations. Although a student may request an accommodation at any time, it is best to initiate the application process at least four weeks before a student wishes to receive an accommodation. Students may begin the accommodation process by submitting a self-identification form online at https://nau.edu/disability-resources/student-eligibility-process or by contacting Disability Resources. The Director of Disability Resources, Jamie Axelrod, serves as NAU's Americans with Disabilities Act Coordinator and Section 504 Compliance Officer. He can be reached at jamie.axelrod@nau.edu.

## RESPONSIBLE CONDUCT OF RESEARCH

Students who engage in research at NAU must receive appropriate Responsible Conduct of Research (RCR) training. This instruction is designed to help ensure proper awareness and application of well-established professional norms and ethical principles related to the performance of all scientific research activities. More information regarding RCR training is available at https://nau.edu/research/compliance/research-integrity.

## SENSITIVE COURSE MATERIALS

University education aims to expand student understanding and awareness. Thus, it necessarily involves engagement with a wide range of information, ideas, and creative representations. In their college studies, students can expect to encounter and to critically appraise materials that may differ from and perhaps challenge familiar understandings, ideas, and beliefs. Students are encouraged to discuss these matters with faculty.

## Epilogue

This course will help you learn how to handle problems that are larger and more complicated than you will find in the back of a given textbook; in other words, real world problems. While it is not a significantly difficult course, it does take regular and consistent involvement, and just plain work. If you feel you are falling behind, come see your Instructor or your FYLI Peer TA as soon as possible. Don't put off getting help because you think you will do better later on. The course is designed to build on each previous week's activities and if you have struggled in the previous week, it will probably be even more difficult during the current week.

As long as we all jump in and work together, we can have some fun and learn things that will make you even more successful in future courses and in your careers.

Updated 8/20/2018