

Hesston College
BuCS 238 – Computer Programming II
Spring 2021 Synchronous ONLINE Course
(meets ONLINE during regular class time starting January 11, 2021)

MISSION STATEMENT

Hesston College, a college of Mennonite Church USA, educates and nurtures each student within Christ-centered community, integrating thought, life, and faith for service to others in the church and the world.

COURSE INFORMATION

Faculty: Bob Harder
Office: K102 (Kropf Center)
Office Hours: TBD
Telephone: 620.327.8322
Email: bobh@hesston.edu
Class Times: MWF 1:10-2:00pm
Credit Hours: 3 credits
Classroom: K130 CIT Computer Lab (Kropf Center)

REQUIRED TEXTBOOKS/INSTRUCTIONAL RESOURCES

Dale, Nell. *C++ Plus Data Structures*. 5th edition. Burlington, MA: Jones and Bartlett Learning, 2013.

TECHNOLOGY REQUIRED FOR ONLINE ACCESS

You will need a computer with internet access, audio, microphone and an internal or external webcam. Our program development environment requires a Windows-based operating system (Win 10 preferred).

CATALOG DESCRIPTION

BuCS 238 Computer Programming II focuses on structured programming techniques and object-oriented programming. Topics for this second course in computer programming include software engineering principles, sorting and searching algorithms, dynamic variables and data structures.
Prerequisite: BuCS 138 or consent of instructor.

HESSTON COLLEGE OUTCOMES ADDRESSED IN THIS COURSE

1. Persons with intellectual and practical skills
c – media and information literacy

COURSE STUDENT LEARNING OUTCOMES

1. Define computer programming terms.
2. Apply basic computer programming concepts and principles.
3. Analyze, design, diagram, write and document computer algorithms and programs.
4. Identify and resolve computer program syntax and logic errors.

COURSE ASSESSMENTS

<u>Hesston College Outcome</u>	<u>Course Outcomes</u>	<u>Assessment Activity</u>
1 c	1, 2, 3, 4	Assignment 1
1 c	1, 2, 3, 4	Assignment 2
1 c	1, 2, 3, 4	Assignment 3
1 c	1, 2, 3, 4	Assignment 4
1 c	1, 2, 3, 4	Assignment 5
1 c	1, 2, 3, 4	Assignment 6
1 c	1, 2, 3, 4	Assignment 7
1 c	1, 2, 3, 4	Assignment 8
1 c	1, 2, 3, 4	Final Exam

EVALUATION POLICY / GRADING SCALE

Assignments	70%	100 – 90%	A
Professionalism	10%	89 – 80%	B
		79 – 70%	C
Final Exam	20%	69 – 60%	D
		less than 60%	NC

Late assignments will not be accepted unless approved in advance. All non-group assignments are to be completed individually. Midterm grades will be evaluated based on the current class grade.

Professionalism is a vital trait in the business community. All Computer Science/Computer Information Technology students are assumed to be professionals and will start with 100 points (10% of the final grade). A first instance of unprofessional behavior will result in a verbal warning. A second instance will result in a written warning and the loss of the 100 professionalism points. The class instructor has the option of returning some or all of the professionalism points if consistent professional behavior is subsequently exhibited.

ATTENDANCE POLICY

Students are excused for college-approved activities, such as: scheduled games for athletic teams, scheduled music and drama programs and trips, Student Life RA retreats, and academic activities including professional conferences and field trips. Students are not excused for practice in any sport, music or drama rehearsals or service activities not part of a class-organized experience that counts for credit.

Students also are responsible to initiate contact with each instructor whose class the students will miss by the last class prior to the absence in case of absences known ahead of time. For absences due to college-approved group activities, students must complete and submit all assignments on or before the due dates for all classes that will be missed.

Attendance will be taken at the beginning of each class period. After one absence week, each additional absence week not approved in advance may result in a one-letter grade reduction. Unless approved in advance, two late arrivals will count as one absence for grading purposes. The Hesston College Vice President of Academics, and the college's Student Support Team all have weekly knowledge of your class attendance records.

ADMINISTRATIVE COURSE WITHDRAWAL

Students are expected to attend all classes, complete and submit assignments on time, and behave in a manner appropriate for a college classroom. A student who repeatedly fails to complete assignments, disrupts class, and/or is chronically absent from class sessions for a course may be administratively withdrawn from the course by the Associate Academic Dean upon the request of the professor for the course, and in consultation with the academic advisor, the financial aid office, and, if necessary, the Dean of Global Engagement. This action may occur at any point during the term. The student will be notified prior to such action.

Students missing 20 percent or more of the scheduled meetings for a course, regardless of the number of excused/unexcused absences, may be subject to administrative course withdrawal. The grade assigned will be a W prior to the withdrawal deadline or a NC after the withdrawal deadline. Instructors are responsible for documenting individual attendance records, online, warning students with excessive absences and communicating actions with the associate academic dean.

AMERICAN WITH DISABILITIES ACT AND SECTION 504

The American with Disabilities Act (ADA) of 1990 and amended in 2009, and Section 504 of the Rehabilitation Act (Section 504), prohibit discrimination against individuals with disabilities. By law, Hesston College is required to provide *reasonable* accommodations for otherwise qualified students with disabilities. A reasonable accommodation is defined as "assistance in or appropriate changes to an educational environment which will enable a student to participate in that environment despite a disability." The term *disability* is defined, in general, as "a physical or mental impairment that substantially limits one or more major life activities."

Students who wish to request accommodations should contact the Access Lab and Disability Services Coordinator (DSC), Kristin Kaufman at (620) 327-8213, or kristin.kaufman@hesston.edu.

STATEMENT ON ACADEMIC DISHONESTY AND PLAGARISM

Academic dishonesty, including plagiarism and cheating, will not be tolerated. Students are responsible for knowing what constitutes these offenses and must not engage in them in their work. Any student committing such offenses will be referred to the Academic Dean and reported to the Vice President of Academics. Penalties for such activities include: a zero for the assignment (first offense) and NC for the course to dismissal from Hesston College for subsequent offenses. For further information regarding this policy, refer to the [Hesston College Course Catalog](#).

STATEMENT ON CONFIDENTIALITY AND MANDATORY REPORTING

As a professor, one of my responsibilities is to help create a safe learning environment on our campus. I also have a mandatory reporting responsibility related to my role as a professor. It is my goal that you feel able to share information related to your life experiences in classroom discussions, in your written work, and in our one-on-one meetings. I will seek to keep information you share private to the greatest extent possible. However, I am required to share with the Title IX coordinator information regarding sexual misconduct or information about an incident that may have occurred while at Hesston College. Students may speak to someone confidentially by contacting our non-mandatory reporters: [campus counselor and campus pastor](#). Students may also choose to [self-report to the Title IX coordinator](#) or to report a case anonymously. Further information on keeping our campus safe can be found on the [Hesston College website](#).

TECHNOLOGY EXPECTATIONS

Hesston College is committed to making the learning experience as successful for you as possible. In order to ensure this, here is a review of key technical requirements;

1. You are responsible for your own computer system and are required to have a reliable Internet Service Provider. Should you have difficulty connecting to the Internet, consult your Internet Service Provider for technical support.
2. Our learning management system is called Moodle. Your assignments will be given to you on Moodle, and you will submit your assignments on Moodle. A link is provided on myHesston.
3. You must have access to the Google suite provided by Hesston College, including but not limited to Gmail, Drive, Docs, Calendar and Meet. A link is provided on myHesston. You are expected to check email at least one per day. Further information is available on the [IT website](#).
4. You are required to have the MS Office suite or other software compatible with the OpenXML file format. A free download is available at the [IT website](#). Assignments must be submitted as Google docs, Word documents, or as a PDF file.
5. Should you have technical difficulties at a time when an assignment is due, you are responsible to find an alternate way to submit your work. This may require you to find another computer to use at a worksite, friend's home, library, local college, or internet café. In some situations, you can mail, fax, or hand deliver your work.
6. Technology problems do not relieve you of the responsibility of attendance requirements, turning in your assignments, class participation, or any other course work. If the Hesston College online server has technical difficulties when an assignment is due, your instructor will make alternative arrangements for you. Be sure to contact your instructor regarding any problems you are having and make the necessary arrangements for completing your course work.

CLASSROOM EXPECTATIONS

Texting, Internet browsing, messaging, emailing, or gaming during class is inappropriate and unprofessional. Your behavior becomes part of your final grade.

OTHER COURSE REQUIREMENTS AND INFORMATION

Before each class, students are expected to:

1. Check the course schedule for assignment due dates.
2. Go over the assigned reading from the text.
3. Complete assignments and homework by the due date.
4. Notify your instructor in advance if you can't attend or will be late. Otherwise, be on time.

The ACCESS lab (x8213) is located in the library and is available for study and learning support. Tutors are available to you at no charge. Contact your instructor if you would like to use this excellent service.

Prepare yourself to invest an average of 6 hours per week in additional study. The following table shows the approximate time by week you should expect to spend on various classroom activities:

Total study time estimate for this class: 90 hours

Total	Week	Read	Program	Other	Case/Exer	Pages
4.2	1	0.7	3.0		0.5	20
5.5	2	1.5	3.0		1.0	45
4.6	3	1.1	3.0		0.5	33
5.5	4	1.5	3.0		1.0	44
4.1	5	0.6	3.0		0.5	18
5.8	6	0.3	5.0		0.5	8
5.1	7	1.6	2.0	1.0	0.5	47
6.1	8	0.6	5.0		0.5	19
5.9	9	1.9	3.0		1.0	56
4.2	10	1.2		2.5	0.5	35
5.6	11	2.1	3.0		0.5	64
7.0	12	2.0	3.0	1.5	0.5	61
7.0	13	3.0	3.0		1.0	89
7.2	14	1.2	3.0	2.5	0.5	37
5.9	15	1.9	3.0		1.0	57
6.4	16	2.4	3.0		1.0	72

DISCLAIMER

The dynamics of the course or a change in certification may necessitate a change in the syllabus or schedule at the discretion of the instructor. Any changes will be posted on Moodle.

COURSE OUTLINE/CALENDAR

- 1 – Jan 11* Course introduction to syllabus, Moodle, course outline, CIT Computer Lab
Java to C++ transition
Software Engineering Principles
Read: 1 - 20
Review Chapter 1 Exercises
Assignment 0 – GasPrice
Assignment 1 – Package due Mon, 25 Jan 2021
- Jan 18* **Martin Luther King Jr. Day** (no class)
- 2 – Jan 20* Java to C++ transition
Verification of software correctness
Read: 20 - 64
Review Case Study and Chapter 1 Exercises
Assignment 1 – Package due Mon, 25 Jan 2021
- 3 – Jan 25* Types of data
Arrays
Object-oriented programming (classes)
Read: 65 - 97
Review Chapter 2 Exercises
Assignment 1 – Package due Mon, 25 Jan 2021
Assignment 2 – Sudoku due Mon, 8 Feb 2021
- 4 – Feb 1* Exception handling, namespaces, comparison of algorithms (Big-O notation)
ADT Unsorted List introduction
Read: 97 - 140 (97-138)
Review Case Study and Chapter 2 Exercises
Assignment 1 REDO – Package due Mon, 1 Feb 2021
Assignment 2 – Sudoku due Mon, 8 Feb 2021
- 5 – Feb 8* ADT Unsorted List (array-based)
File input / output
Read: 140 - 157 (136-152)
Review Chapter 3 Exercises
Assignment 2 – Sudoku due Mon, 8 Feb 2021
Assignment 3 – TwoNum Class due Mon, 22 Feb 2021
- 6 – Feb 15* Pointers
Read: 158 – 165 (153-160)
Review Chapter 3 Exercises
Assignment 2 REDO – Sudoku due Mon, 15 Feb 2021
Assignment 3 – TwoNum Class due Mon, 22 Feb 2021
- 7 – Feb 22* ADT Unsorted List (linked list)
Comparing array-based and dynamic implementations
Read: 165 – 211 (160-189)
Review Case Study
Chapter 3 Exercises 9-12, 13-18
Assignment 3 – TwoNum Class due Mon, 22 Feb 2021
Assignment 4 – Sudoku2 due Mon, 8 Mar 2021

- 8 – Mar 1 ADT Sorted List (array-based)
Binary search
Dynamically allocated array
Read: 213 - 231 (191-209)
Review Chapter 4 Exercises
Assignment 3 REDO – TwoNum Class due Mon, 1 Mar 2021
Assignment 4 – Sudoku2 due Mon, 8 Mar 2021
- Mar 3 **Midterm**
- 9 – Mar 8 ADT Sorted List (linked list)
ADT Stack application
ADT Stack (array-based)
ADT Stack (linked list)
Read: 231 - 300 (209-278)
Review Case Study and Chapter 4 Exercises
Assignment 4 – Sudoku2 due Mon, 8 Mar 2021
Assignment 5 – Files due Mon, 22 Mar 2021
- 10 – Mar 15 ADT Queue application
ADT Queue (array-based)
ADT CountedQueue
ADT Queue (linked list)
Efficiency of queue implementations
Read: 301 – 355 (279-338)
Review Case Study
Chapter 5 Exercises 4, 5, 6, 7, 24, 25, 26, 27, 28, 29
Assignment 4 REDO – Sudoku2 due Mon, 15 Mar 2021
Assignment 5 – Files due Mon, 22 Mar 2021
- 11 – Mar 22 Templates
Circular and Doubly Linked Lists
Copy structures
Friend functions
Overloading operators
Read: 357 – 389 (339-370)
Review Chapter 6 Exercises
Assignment 5 – Files due Mon, 22 Mar 2021
Assignment 6 – Circular Linked List due Mon, 5 Apr 2021
- 12 – Mar 29 Linked List (array of records)
Specialized lists
Recursion
Read: 389 - 443 (371-423)
Review Case Study
Chapter 6 Exercises 14, 15
Assignment 5 REDO – Files due Mon, 29 Mar 2021
Assignment 6 – Circular Linked List due Mon, 5 Apr 2021
- Apr 2 **Good Friday** (no class)

- 13 – Apr 5* Recursion application
 Tree terminology
 ADT Binary Search Tree
Read: 443 – 531 (423-509)
Review Case Study and Chapter 7 Exercises
Assignment 6 – Circular Linked List due Mon, 5 Apr 2021
Assignment 7 – Fibonacci due Mon, 12 Apr 2021
- 14 – Apr 12* Set operations
 ADT Set
 ADT Binary Search Tree operations
 Tree traversals
 Binary tree (non-linked implementation)
Read: 531 - 567 (509-545, 587-597)
Review Case Study
Chapter 8 Exercises 8, 11, 12, 13, 14, 15, 16, 42, 43, 44, 45
Assignment 7 – Fibonacci due Mon, 12 Apr 2021
Assignment 8 – ADT Set due Tue, 27 Apr 2021 at 1:00pm
- 15 – Apr 19* Heaps
 ADT Priority Queue
 Graph terminology
 ADT Graph
Read: 569 – 625 (547-603) except Sets
Review Case Study and Chapter 9 Exercises
Assignment 6 REDO – Circular Linked List due Mon, 19 Apr 2021
Assignment 7 REDO – Fibonacci due Mon, 19 Apr 2021
Assignment 8 – ADT Set due Tue, 27 Apr 2021 at 1:00pm
- Apr 26 (Mon)* Reading Day (no class)
- Apr 27 (Tue)* **Final Exam 1:00-2:50pm**
 Sorting
 Searching (including binary search)
 Efficiency considerations
 Hashing functions
 Radix sort
Read: 627 – 698 (605-676)
Review Case Study and Chapter 10 Exercises
Assignment 8 – ADT Set due Tue, 27 Apr 2021 at 1:00pm