Northern Essex Community College

Computer and Information Sciences (CIS)

Computer Science 2 – CIS 252

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| **Instructor** | Michael Penta |
| **Email** | mpenta@necc.mass.edu |
| **Phone** | (978) 556-3892 |
| **Office** | Haverhill - TC 227 / Lawrence – LH305 |
| **Office Hours** | M 10:15am – 11:15am TC219  W 1:35pm – 2:35pn LH305  R 12:15pm – 1:15pm TC219 |
| **Meeting Times** | TR, 10:10a -12:15pm, TC 130 |

# General Course Description

This course focuses on the development of data structures to organize information in solving problems with computers. Typical structures include arrays, stacks, queues, linked lists, and trees. Coverage will include searching, sorting and algorithm analysis. Laboratory projects will enable students the opportunity to implement these data structures.

***4 Credit Hours*** *- 3 Lecture hours, 2 Lab hours*

**Prerequisites:**

CIS141 Computer Science I with a minimum Grade of C

or

CIS160 Computer Science I with a minimum Grade of C

**Attributes:** Computer Science Elective, Free Elective

# Course Learning Outcomes

The student will learn how to apply the programming process using the C programming language. The programming process will include program specifications, designing algorithms, coding, testing and debugging programs. Programming topics will include input/output, decision structures, looping, functions, and dynamically allocated arrays.

Upon successful completion of this course the student will be able to:

* Choose appropriate data structures for typical programming problems.
* Implement data structures including stacks, queues, linked lists, hash tables, and trees.
* Show the advantages and disadvantages of various common data structures
* Show how to derive the efficiency of an algorithm and compare algorithm efficiencies
* Use object oriented design in a complex project.
* Utilize generic data types in a solution
* Program a complex project using industry standard techniques.

# Course Material

## Required Material

Open Educational Resource:

OpenDSA – Free interactive text

A link and instructions are posted on blackboard

## Additional Material

Students will need a mechanism for storing coursework (flash drive, cloud storage, etc)

# Course Requirements and Teaching Procedures

## Course Meeting

During our meetings, we will discuss the reading topic of the week; go over any questions that may arise from the reading or the labs and other assignments. The class will be a mix of lecture, readings, videos, small group work, hands-on instruction, and programming activities.

## Blackboard

Blackboard is an integral part of the course. It is essential that you log into the Blackboard site AT least twice a week. Announcements, class resources, and assignment submission will all be handled through the blackboard site. Help with Blackboard is available in the library and at the tutoring center.

## Quizzes and Exams

There will be a midterm exam, a final exam, and periodic quizzes. There are no make-ups for quizzes or exams.

## Assignments

The course will have a number of in and out of class assignments (programming and otherwise) to support lecture and readings these are absolutely essential for success in the course. All assignments must be submitted through Blackboard by the date posted in Blackboard. Late work will not be accepted. Keeping up with the course work is important as many concepts build on top of one another.

## Attendance and Participation

Attendance and participation at lecture is required and expected. The college defines a non-participating student as “one who has excessive absences, has missed quizzes, tests or papers, or otherwise has failed to meet the participation standard clearly delineated in the course instructor’s syllabus.”

Specifically, you may be considered non-participating if you

* Miss more than 6 hours of course lecture meeting time
* Miss more than 2 quizzes
* Miss an exam
* Missing more than 1 assignment of any type

## Workload

Keeping up with the workload is essential to success in the course. The out-of-class workload for any course can be roughly estimated at 3 hours of out-of-class work for every hour you are in class (4 credits ~ 12 hours). Planning and writing programming takes time and practice. Build a strong foundation for yourself – allocate the time to do the work

# Grading

## Grade Breakdown

|  |  |
| --- | --- |
| Task | Percentage |
| Midterm and Final Exams | 40 |
| Problem Sets | 25 |
| Projects | 35 |

## NECC Grading System

|  |  |  |
| --- | --- | --- |
| Grade | Quality Points | Numeric Range |
| A | 4.00 | 93-100 |
| A- | 3.70 | 90-92 |
| B+ | 3.30 | 87-89 |
| B | 3.00 | 83-86 |
| B- | 2.70 | 80-82 |
| C+ | 2.30 | 77-79 |
| C | 2.00 | 73-76 |
| C- | 1.70 | 70-72 |
| D+ | 1.30 | 67-69 |
| D | 1.00 | 60-66 |
| F | 0.00 | 59 or less |

# Communication

My college email is the best way to contact me (mpenta@necc.mass.edu). I typically respond within 48 hours. Do not use Blackboard Mail, I do not check it. When you send an email, you should include the following:

* Your name
* Your class (either course number or title, day, and time)
* A relevant subject

# Statement on Plagiarism and Cheating

You are required to abide by all academic honesty rules and guidelines: **All work you are submitting must be your own, unless you have gotten explicit permission to collaborate with someone else.** Any material you submit that you have obtained from another source (a book, journal, magazine or Web site) must be properly quoted and credited with precise references. Failure to do so is considered plagiarism. **Even reusing your own work without citation is considered self-plagiarism. Recycling papers, turning the same paper in for two different courses, may also considered plagiarism.**

All cases of plagiarism and cheating shall be reported to the Dean of Students. Any violation of any of these rules will result in any or all of the following:

* a grade of "0" for the assignment in question, or
* a grade of "F" in the course, or
* disciplinary action according to College rules.

Please be on notice that we consider plagiarism and cheating serious academic offenses and shall enforce the penalties specified above.

# Mental Health and Social Services

The Counseling Center at NECC supports the emotional well-being of the student body and is committed to a respectful understanding and honoring of the social, emotional, and cultural backgrounds represented by each individual student. The center provides time-limited individual counseling, crisis intervention, and prevention-oriented outreach to students at no additional charge. More information can be found on our webpage: <https://www.NECC.MASS.EDU/counseling> or by calling 978-556-3730.

In a crisis situation, or after hours call 911.  The National Suicide Prevention hotline also offers a 24-hour hotline at [800-273-8255](tel:(800)%20273-8255).

For social service related issues, housing, food insecurity or childcare you can find information at <https://www.necc.mass.edu/social-services>

For immediate referrals, United Way runs a 24-hour, multilingual referral line at 2-1-1 or 1-877-211-6277.

# Documented Disabilities

Information/Services for Students with Documented Disabilities:

* **Learning Accommodations Center**:  Serving students with documented disabilities such as; learning disabilities, attention deficit disorders, autism spectrum disorders, brain injuries, chronic illness, low vision/blind, physical disabilities, psychiatric disabilities and seizure disorders. Visit us in the Student Center SC111, call (978) 556-3654, or email [lacenter@necc.mass.edu](mailto:lacenter@necc.mass.edu)
* **Deaf and Hard of Hearing Services:** Serving students who are deaf or hard of hearing. Visit us in the Student Center SC110, call 978-241-7045 (VP/Voice) or email [deafservices@necc.mass.edu](mailto:deafservices@necc.mass.edu)

Expected Course Schedule

* Subject to change
* Readings are from the required textbook.
* See Blackboard for current due dates and assignments

CIS 252 - Computer Science II - Topical Syllabus

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| --- | --- | --- |
| Week | Topic | Reading |
| 1 | Introduction | CH1 |
| 2 | Objects, Inheritance, Interfaces, Exceptions, Generics, Java and Memory | Ch 2 & additional readings |
| 3 |
| 4 | List Interface and Array Based List | Ch 3 |
| 5 | Algorithm Analysis | Ch 4 |
| 6 | Stacks | Ch 6 |
| 7 | Recursion and Sorting | Ch 7 & 8 |
| 8 | Midterm |  |
| 9 | Queues | Ch 9 |
| 10 | Linked Lists | Ch 10 |
| 11 | Binary Trees | Ch 11 |
| 12 | Maps and Hashes | TBA |
| 13 | Priority Queue | TBA |
| 14 | Graphs | TBA |
| 15 | Final Exam |  |