**Lincoln University**

**Department of** **Computer Science**

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| **Course Title:** | Data Structure | **Course number:** | CSC254 |
| **Credit Hours**  | 4 | **Prerequisite (s):** | CSC159 |
| **Term:** | Fall 2017 | **Co-Requisite (s)** |  |
| **Course Method** |  | **Meeting day and Time:** |  |
| **Instructor:** |  | **Classroom/lab/Studio Location:** |  |
| **Office location:** |  | **e-mail:**  |  |
| **Office Hours:** |  | **Phone Extension:** |  |

**COURSE DESCRIPTION:** This course will focus on algorithms, analysis, and the use of basic and advanced data structures. Among the specific data structures covered are strings, stacks, records, linked lists, trees and graphs. Recursion will also be covered. Sequential and random files, hashing and indexed sequential access methods for files will be discussed. In addition, some standard computer science algorithms (sorting and searching) will be discussed.

**REQUIRED TEXT:**

C++ How to program by Deitel & Deitel-Fifth Edition *(Data Structure Chapters)*.

**REQUIRED MATERIALS:**

**Assessment Criteria & Alignment (usE Numbers only)**

|  |  |  |  |
| --- | --- | --- | --- |
| CSLO | PSLOs | ILOs | Direct and Indirect Assessment Methods |
| CSLO 1 | PSLO #2 | ILO 5 | 1) Test Questions about various Data Structures assessed through a PSLO specific rubric2) Application of Data Structures in C++ Programming Projects at Design Level assessed through a PSLO specific rubric |
| CSLO 2 | PSLO #1 | ILO 2 | 1) Test Questions on implementation of various Data Structures in C++ Language assessed through a PSLO specific rubric2) Programming Projects on implementation of various Data Structures in C++ Language assessed through a PSLO specific rubric |
| CSLO 3 | PSLO #2 | ILO 5 | 1) Test Questions on algorithms assessed through a PSLO specific rubric2) Programming Projects on algorithms assessed through a PSLO specific rubric |
| CSLO 4 | PSLO #2 | ILO 5 | 1) Test Questions on sorting and searching assessed through a PSLO specific rubric)2) Programming Projects on sorting and searching assessed through a PSLO specific rubric |
| CSLO 5 | PSLO #1 | ILO 2 | 1) Test Questions on dynamic memory allocations/ linked lists assessed through a PSLO specific rubric2) Programming Projects on dynamic memory allocations/ linked lists assessed through a PSLO specific rubric |

**Course Student Learning Outcomes (CSLO):**

Upon successful completion of this course, students will be able to:

* **CSLO #1:** Demonstrate knowledge of underlying data structures needed for solving problems and programming.
* **CSLO #2:** Implement/ utilize various data structures using a programming language such as C++.
* **CSLO #3:** Analyze algorithms in connection with data structures.
* **CSLO #4:** Demonstrate knowledge of various searching and sorting techniques.
* **CSLO #5:** Apply dynamic memory allocation in creation

**Program Student Learning Outcomes (PSLO):** (List only those assessed with this course.)

* **PSLO #1 [T]:** Programming (in Java)
* **PSLO #2 [T]:** Solving Problems & Algorithms
* **PSLO #3 [T]:** Analyzing & Using Data

**Institutional Learning Outcomes (ILO):** (List only those assessed with this course.)

* **ILO#2:** Technology and Information Literacy
* **ILO#5**: Critical thinking
* **ILO#7:** Quantitative literacy

**Calculation of Final Grades**:

The final score will be calculated based on the scores earned in each of the test and project listed below using a weighted average formula shown. The Final letter grade will be awarded using the grading scale guideline shown.

**1) Three Written Tests 300 Points**

**2) Final Exam 100 Points**

**3) 4 Projects 80 Points**

**Tests and Final Exam:** 80%
**Projects :**     20%

**Final Score**= ( 3 Test Scores + Final Test Score )/400 \* 80

 + (P1 Score + P2 Score + P3 Score + P4 Score)/ 80 \* 20

**GRADING SCALE:** (Should follow Department and/or College Template)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Grade | A | A- | B+ | B | B- | C+ | C | C- | D+ | D | F |
| GPA Points | 4.0 | 3.7 | 3.3 | 3.0 | 2.7 | 2.3 | 2.0 | 1.7 | 1.3 | 1.0 | 0.0 |
| % | 100-93 | 92.9-90 | 89.9-88 | 87.9-82 | 81.9-80 | 79.9-78 | 77.9-72 | 71.9-70 | 69.9-67 | 66.9-60.1 | 60 and under |

**SCHEDULE OF LEARNING topics covered**

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| --- |
| **Class Meets:** **•ASSIGNMENT SELECTION & SCHEDULE MAY BE SUBJECT TO CHANGE•** |
| **Week 01:** | . Review of C++ Topics . Classes and Structures |
| **Week 02:** |
| **Week 03:** | . Arrays. Sorting (non recursive). Stacks |
| **Week 04:** |
| **Week 05, 6:** | . Queues and Priority Queues. Recursion. Sorting (recursive). Strings. Operator Overloading |
| **Week 07:** |
| **Week 08:****Midterm** | **Mid-term Week** |
| **Week 09:** | . Pointers. Linked Lists. Trees . Searching. Hashing. Graphs. Networks. File Structure |
| **Week 10:** |
| **Week 11:** |
| **Week 12:** |
| **Week 13:** |
| **Week 14:** |
| **Week 15:** |

#### **University ATTENDANCE POLICY:**

Lincoln University uses the class method of teaching, which assumes that each student has something to contribute and something to gain by attending class. It further assumes that there is much more instruction absorbed in the classroom than can be tested on examinations. Therefore, students are expected to attend all regularly scheduled class meetings and should exhibit good faith in this regard.

Please note the following (click the link below for more detailed information):

1. **Four** absences may result in an automatic failure in the course.
2. **Three** tardy arrivals may be counted as one absence.
3. Absences will be counted starting **January 25, 2016**
4. In case of illness, death in the family, or other extenuating circumstances, the student must present documented evidence of inability to attend classes to the instructor, Vice President for Student Affairs and Enrollment Management. However, in such cases the student is responsible for all work missed during those absences.

More detailed information available at the following link: <http://www.lincoln.edu/registrar/2014Catalog.pdf>

**STUDENTS WITH DISABILITIES STATEMENT:**

Lincoln University is committed to non-discrimination of students with disabilities and therefore ensures that they have equal access to higher education, programs, activities, and services in order to achieve full participation and integration into the University.  In keeping with the philosophies of the mission and vision of the University, the Office of Student Support Services, through the Services for Students with Disabilities (SSD) Program, provides an array of support services and reasonable accommodations for students with special needs and/or disabilities as defined by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990.  The Services for Students with Disabilities Program seeks to promote awareness and a campus environment in which accommodating students with special needs and/or disabilities is natural extension of the University’s goal.

Any student with a documented disability should contact the Office of Student Support Services.

<http://www.lincoln.edu/studentservices/index.html>

**UNIVERSITY ACADEMIC INTEGRITY STATEMENT:**

Students are responsible for proper conduct and integrity in all of their scholastic work. They must follow a professor's instructions when completing tests, homework, and laboratory reports, and must ask for clarification if the instructions are not clear. In general, students should not give or receive aid when taking exams, or exceed the time limitations specified by the professor. In seeking the truth, in learning to think critically, and in preparing for a life of constructive service, honesty is imperative. Honesty in the classroom and in the preparation of papers is therefore expected of all students. Each student has the responsibility to submit work that is uniquely his or her own. All of this work must be done in accordance with established principles of academic integrity.

<http://www.lincoln.edu/registrar/2014Catalog.pdf>

**POLICY ON ELECTRONIC DEVICES IN CLASSROOM:**

Cellphone and other electronic devices use is not permitted at any time during class (unless instructed to do so by the instructor). Cellphones and other electronic device must be put away out of sight during the entire class. Failure to put away phones completely out of sight will lead to immediate dismissal from class and you will be marked absent for the day.