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AC001

**Basic Information**

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| Faculty | Dr. Muhammad Golam Kibria, Associate Professor | | | | | | | | |
| Office Hour | Class Hours: Sunday and Tuesday: 11:30 AM – 12:50 PM, Room – PA209  Consultation Hours: Sunday and Tuesday: 1:10 PM – 2:30 PM | | | | | | | | |
| Contact Details | Office: PC-320, email: [golam.kibria@ulab.edu.bd](mailto:golam.kibria@ulab.edu.bd) | | | | | | | | |
| Course Pre-requisites | CSE 103, CSE 201 | | | | | | | | |
| Dept. offering the course | Department of Computer Science and Engineering | | | | | | | | |
| Course Title | Data Structures | | | | | | | | |
| Course Code | CSE207 | | Sec - 02 | | Credit | 03 | Term | Fall 2019 | |
| Number of Lectures | 24 | Number of Tutorials | |  | Number of Practical | |  | Total | 24 |

**Course Details**

**1. Course Description**

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| This course studies the principles of programming languages with an emphasis on programming language implementation for various applications considering data structures. This course will focus on logical structures of data, their physical representation, design and analysis of algorithms operating on the structures, and techniques for program development and debugging. Emphasis will be placed on the appropriate use and choice of standard data structures. The purpose of this course is to provide the students with solid foundations in the basic concepts of programming: data structures and algorithms.  **2. Course Objective**   * To **demonstrate** understanding of the fundamentals of data structures (e.g. arrays, linked lists, stack, queue, graph, and trees). * To **utilize** data structures in various applications including the ability to implement algorithms for the creation, insertion, deletion, searching, and sorting of each data structure. * To **analyze** and compare algorithms for efficiency using Big-O notation language commands. * To c**reate**, compile and test data structure operations and algorithms in C programming language. |

**3. Intended learning outcomes of the course (ILOs)**

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| --- | --- |
| KNOWLEDGE | 1. **Understand** the concept for manipulating stacks, queues, linked lists, trees, and graphs. |
|  |
| SKILLS | 2. **Utilize** data structures in various applications incuding the ability to implement  3. **Diagnosing** problems and solve practical problems using Data Strustures |
| 4. Critical **analysis** of situation and good programming knowledge and skills |
| ATTITUDE | 5. Design and **develop** real world problems |

**4. Mapping of Course LO and PLO:**

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| **Learning Outcome (LO) of the Course** | **Program Learning Outcome (PLO)** | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| **ILO 1** | MJ |  |  |  |  |  |  |  |  |  |  |  |
| **ILO 2** | MJ |  |  | MJ | MN |  |  |  |  |  |  |  |
| **ILO 3** |  | MJ | MJ |  |  |  |  |  |  |  |  |  |
| **ILO 4** |  |  | MJ | MJ | MN |  |  |  |  |  |  |  |
| **ILO** 5 |  | MJ | MN | MJ | MN | MJ |  |  |  |  |  |  |

**5. Contents**

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| **ILO** | **Topic** | **Teaching Strategy** | **Assessment Strategy** | **Number of Sessions** |
| 1-3 | Introduction to data structure | Lecture | Q/A | 4 |
| 1-3 | Array and Pointers | Lecture | Q/A | 4 |
| 1-3 | Linked List | Lecture | Q/A | 4 |
| 1-3 | Sorting & Searching | Lecture | Q/A Test | 2 |
| 1-3 | Stack | Lecture | Q/A | 3 |
| 3, 4 | Queue | Lecture | Q/A Assignment | 3 |
| 1, 3 | Graph | Lecture | Q/A | 2 |
| 1, 3 | Tree | Lecture | Q/A  Test | 2 |
|  |  |  | **Total** | 24 |

**6. Teaching & Learning Method**

1. Lecture notes
2. Laboratory notes and programming exercises
3. Textbook materials and additional reference material
4. Web links to active tutorials and other presentation material

**7. A. Assessment Schedule**

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| --- | --- | --- | --- | --- |
| Assessment 1 | Quiz |  | Session | Week 5 |
| Assessment 2 | Assignment |  | Session | Week 8 |
| Assessment 3 | Project |  | Session | Week 12 |
| Assessment 4 | Mid Term |  | Session | As per ULAB schedule |
| Assessment 5 | Final |  | Session | As per ULAB schedule |

**7. B. Weights of Assessments**

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| --- | --- |
| **Data Structures (CSE 207)** | |
| Assessments | **%** |
| Mid-term Examination | 20 |
| Final Term Examination | 40 |
| Attendance and Class Participation | 5 |
| Assignments | 10 |
| Quizzes | 15 |
| Project | 10 |
| **Total** | **100** |

**7.C. Grading Policy**

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| **Policy** | **Letter Grade** | **Grade Point** | **Assessments** |
| 95% and above | A+ | 4.00 | Outstanding |
| 85% to below 94% | A | 4.00 | Superlative |
| 80% to below 84% | A- | 3.80 | Excellent |
| 75% to below 79% | B+ | 3.30 | Very Good |
| 70% to below 74% | B | 3.00 | Good |
| 65% to below 69% | B- | 2.80 | Average |
| 60% to below 64% | C+ | 2.50 | Below Average |
| 55% to below 59% | C | 2.20 | Passing |
| 50% to below 54% | D | 1.50 | Probationary |
| below 50% | F | 0.00 | Fail |
| -- | I | 0.00 | Incomplete |
| -- | W | 0.00 | Withdrawn |
| -- | AW | 0.00 | Administrative Withdrawal |

**8. List of References**

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| Course Notes | Please check the Google Drive, moodle and FB group page to access course materials and notes. |

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| Essential Books | 1. Schaum’s Outline Of Theory and Problems of Data Structures, Latest Edition, Seymour Lipchutz.  2. Mark Allen Weiss, Data Structures and Algorithm Analysis in C++, Third Edition, Addison Wesley |

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| --- | --- |
| Reference Books | 1. Adam Drozdek, Data Structures and Algorithms in C++, Broooks/Cole, 2001.  2. Cormen, Leiserson, Rivest, Stein, Introduction to Algorithms, MIT Press, Second Edition, 2001. |

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| Online Resources | Introduction to data structures, mycodeschool, <https://www.youtube.com/watch?v=92S4zgXN17o&list=PL2_aWCzGMAwI3W_JlcBbtYTwiQSsOTa6P> |

**Facilities Required for Teaching and Learning**

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| Projector, Whiteboard, Internet access from classroom computer, Audio/Visual equipments.\ |

**Course Policies and Procedures**

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| Class attendance: Regular attendances of classes are mandatory and students will be assigned F automatically if he/she misses 6 consecutive classes. All students are expected to attend all scheduled classes, and to read all assigned chapters / materials before coming to class  Late submission of work: Late submission will be followed by penalty, please maintain deadlines. Late submission of homework/assignment will have negative impact on marks.  Unfair means /plagiarism: Plagiarism will be dealt with penalty. Original work is encouraged as they will carry value marks. It is strongly encouraged that the students interact with each other and discuss ideas and course materials among themselves.  Signature (1)  ............................................................ ………….....................................  *Dr. Muhammad Golam Kibria Head of the Department*  Date: Date:  **Appendix-1: Program Learning Outcome (PLO)**   |  |  | | --- | --- | | **No.** | **PLO** | | 1. | Engineering Knowledge | | 2. | Problem Analysis | | 3. | Design/Development of Solutions | | 4. | Investigation | | 5. | Modern Tool Usage | | 6. | The Engineer and Society | | 7. | Environment and Sustainability | | 8. | Ethics | | 9. | Communication | | 10. | Individual and Team Work | | 11. | Life Long Learning | | 12. | Project Management and Finance |   **Generic Skills (Detailed):**   1. **Engineering Knowledge (T)** -Apply knowledge of mathematics, sciences, engineering fundamentals and manufacturing engineering to the solution of complex engineering problems; 2. **Problem Analysis (T)** – Identify, formulate, research relevant literature and analyze complex engineering problems, and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences; 3. **Design/Development of Solutions (A)** –Design solutions, exhibiting innovativeness, for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, economical, ethical, environmental and sustainability issues. 4. **Investigation (D)** Conduct investigation into complex problems, displaying creativeness, using research-based knowledge, and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions; 5. **Modern Tool Usage (A & D)** -Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an understanding of the limitations; 6. **The Engineer and Society (ESSE)** -Apply reasoning based on contextual knowledge to assess societal, health, safety, legal, cultural, contemporary issues, and the consequent responsibilities relevant to professional engineering practices. 7. **Environment and Sustainability (ESSE)** -Understand the impact of professional engineering solutions in societal, global, and environmental contexts and demonstrate knowledge of and need for sustainable development; 8. **Ethics (ESSE)** –Apply professional ethics with Islamic values and commit to responsibilities and norms of professional engineering code of practices. 9. **Communication (S)** -Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions; 10. **Individual and Team Work (S)** -Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings. 11. **Life Long Learning (S)** -Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. 12. **Project Management and Finance (S)** -Demonstrate knowledge and understanding of engineering management and financial principles and apply these to one’s own work, as a member and/or leader in a team, to manage projects in multidisciplinary settings, and identify opportunities of entrepreneurship. |