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| **College** | **IT** |
| **Department** | **Computer Science** |
| **Program** | Computer Science  |
| **Course Title** | Data structures | **Course Number:** | 19041203 |
| **Year** | 2023-2024 | **Semester:** | First |
| **Prerequisite(s)** | OOP |
| **Instructor** | ***Dr. Muhammed Saffarini*** |
| **Instructor's e-mail** | muhammed.saffarini@ptuk.edu.ps |
| **Office Hours** |   |
| **Class Time** | [ 10:00\_11:00] sun , tue[ 11:00\_12:00] sun , tue | **Class Room:** | E328 |
| **Course description** |  |
| **Course Intended Learning Outcomes (CILOs)** | **On successful completion of the course, students will be able to:**1. Gain a strong understanding of data structures.
2. Analyze information to clearly describe problems, identify appropriate solutions, and apply problem solving steps using data structures.
3. Encourage creative thinking to come up with unique solutions for various kinds of problems.
4. Enhance communication and teamwork skills.
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| تاريخ اإلصدار: 2019/5/12 | رقم اإلصدار: )1/0( | رمز الوثيقة: د.ج.أ- إ.ب.خ-ن02 |

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| **Recommended Textbook(s)** | * Introduction to Java programming Book by Y. Daniel Liang
* Data Structures and Algorithms in Java by Michael T. Goodrich, Roberto Tamassia, and Michael H. Goldwasser (Wiley, 2014)
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| **Other required material (References):** |  |
| **Other Resources used (e.g. e- learning, field visits, periodicals, software, etc.)** | - Other resources shall be available on the LMS. |

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| **Course Teaching Methods** |
| **Teaching Method** | **CILOs** |
| Lectures | 1-4 |
| Activities and assignments | 1-4 |

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| **Assessment Type** | **Details/Explanation of assessment in relation to CILOs** | **Weight** | **Date(s)** |
| **Midterm Exam** |  | 20% | As per college exam timetable |
| **Lab** |  | 30% |
| **Activities and assignments** |  | 20% |
| **Final Exam** |  | 30% |
| **Total** |  | 100% |

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| **Course Intended Learning Outcomes (CILOs)** |
| **CILOs** | **Mapping to Program ILOs** |
| **On successful completion of the course,****students will be able to:** | **PILO-1** | **PILO-2** | **PILO-3** | **PILO-4** |
| Gain a strong understanding of data structures. |  |  |  |  |
| Analyze information to clearly describe problems, identify appropriate solutions, and apply problem solving steps using data structures. |  |  |  |  |
| Encourage creative thinking to come up with unique solutions for various kinds of problems. |  |  |  |  |
| Enhance communication and teamwork skills. |  |  |  |  |

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| **Course Weekly Breakdown** |
| **Week** | **Topics Covered** | **CILOs** | **Assessment** |
| 1 |  OOP review | 1 | Mid Exam and Assignments |
| 2 | Complexity | 1 |
| 3 | Recursion | 1,2 |
| 4,5 | ArrayList | 2 |
| 6,7 |  LikedList | 2,3,4 |
| 8 | Stack | 2,3,4 |
| 8 | Queue  | 2,3,4 |
| 9 | **Mid Exam** |  | Final Exam and Assignment |
| 9,10 | Hashing | 2,3,4 |
| 11,12 | Trees | 2,3,4 |
| 13,14 | AVL Trees |  |
| 15 | Graph | 2,3,4 |
| 16 | **Final Exam** |  |