General Information		
Subject: **Data structure**	The student will develop applications that organize information based on abstract data structures using the object-oriented paradigm to speed up access to stored data.	**Group: TI 4-3** **Classroom or laboratory:** Software laboratory
Name of the Professor: MTIC. Miguel Angel Rodriguez Negrete		**Date:** 08/01/21

Unit 1: Basic concepts	**Practice Hours**	**Theory Hours**
Objective of the Unit: The student will develop programs that integrate the use of recursion and define data structures to generate programming alternatives.	10	5
Learning Outcome: It will elaborate a document that reports the programs carried out describing: use of abstract data types, and classes that include recursive methods.		

Unit 2: Arrangements	**Practice Hours**	**Theory Hours**
Objective of the Unit: The student will develop programs that include search and sorting methods, using one-dimensional and two-dimensional arrays to manipulate data in an organized manner.	10	5
Learning Outcome: Elaborate based on problems given a document that reports the programs that include: exercises that incorporate search and sorting methods using one-dimensional and two-dimensional arrays.		

Unit 3: Lists	**Practice Hours**	**Theory Hours**
Objective of the Unit:. The student will develop programs using lists to manipulate data in an organized manner	**12**	**5**
Learning Outcome: It will elaborate based on problems given a document that reports the programs carried out that include: practical exercises that incorporate lists and their operations.		

Unit 4: Stacks	**Practice Hours**	**Theory Hours**
Objective of the Unit: The student will develop programs using Stacks to manipulate data in an organized manner.	**12**	**5**
Learning Outcome: Will elaborate based on problems given a document that reports the programs that include: practical exercises that incorporate Stacks and their operations.		

Unit 5: Queues	**Practice Hours**	**Theory Hours**
Objective of the Unit:. The student will develop programs using queues to manipulate data in an organized manner.	**12**	**5**
Learning Outcome: Elaborate based on problems given a document that reports the programs that include: practical exercises that incorporate colas and their operations.		

Unit 6 : Trees	Practice Hours	Theory Hours
Objective of the Unit:. The student will develop programs using trees to manipulate data in an organized manner	**18**	**3**
Learning Outcome: Will elaborate based on problems a document that reports the programs that include: practical exercises that incorporate trees and their operations.		

Evaluation Planner for Unit #1					
Session number / Date	**Topics / Subtopics**	**Teaching- Learning Strategies**	**Educational Sources**	**Evaluation Tools for Learning Outcomes**	**Evaluation Criteria of the Unit**
08/Ene/21 2 hrs	**Unit 1** **Topic 1:** Abstract data types 1.1 Describe a data structure, abstract data types, abstract generic data types. 1.2 Differentiate the types of abstract data and a data structure.	Presentation of the subject by the teacher	• Computer • Office • Phyton	• Rubric • Reactive	**Know how to do and be 70%** Participation 5% Task 5% Assistance: 10% Practices 30% Learning result 20% **Know and be 30%** Theoretical Exam: 10% Practice Exam: 20%
11/Ene/20 2 hrs		Presentation by the teacher and activities by the students			
12/Ene/21 2 hrs	**Topic 2**: Recursion 2.1 Explain the concept of recursion. 2.2 Elaborate the coding of applications that use recursion.	Presentation by the teacher			
15/Ene/21 2 hrs		Practices by the teacher and students			
18/Ene/21 2 hrs		Practices by the students			
19/Ene/21 2 hrs	**Unit 2** **Topic 1:** One-dimensional and two-dimensional arrays 1.1 Identify the different types of arrangements and their characteristics. 1.2 Identify the syntax for the declaration and creation of arrays (one-dimensional and two-dimensional). 1.3 Organize datasets through the use of one-dimensional and two-dimensional arrays by performing basic operations (initialization, access, printing and deletion).	Presentation by the teacher			
22/Ene/21 2 hrs		Activity by the students			
25/Ene/21 2 hrs		Presentation by the teacher and activities by the students			

26/Ene/21 2 hrs	**Topic 2:** Sorting and searching methods 2.1 Explain the algorithms of the search methods (sequential and binary) and ordering (bubble, quick sort, shell, merge sort). 2.2 Elaborate the coding of search and order algorithms to solve cases in a POO language.	Presentation by the teacher and activities by the students			
29/Ene/21 2 hrs		Practices by the students			
02/feb/21 2 hrs		Practices by the students			
05/feb/21 2 hrs	First unit test	First unit test			
Hours: **26**					**Evaluation Date:** 05/feb/21

Evaluation Planner for Unit #2					
Session number / Date	**Topics / Subtopics**	**Teaching- Learning Strategies**	**Educational Sources**	**Evaluation Tools for Learning Outcomes**	**Evaluation Criteria of the Unit**
08/feb/21 2 hrs	Unit 3 Topic 1: Definition of list 1.1 Explain the concept of list, its characteristics and terminology. 1.2 Determine the use of the data structure list with respect to an array.	Presentation by the teacher	• Computer • Office • Phyton	• Rubric • Reactive	**Know how to do and be 70%** Participation 5% Task 5% Assistance: 10% Practices 30% Learning result 20% **Know and be 30%** Theoretical Exam: 10% Practice Exam: 20%
09/feb/21 2 hrs		Activity by the students			
12/feb/10 2 hrs	Topic 2: Types of lists (simple, dually linked and circular) 2.1 Identify the different types of lists and their components. 2.2 Determine in which cases it is pertinent to use the different types of lists.	Presentation by the teacher and practices by the students			
15/feb/21 2 hrs		Practices by the students			
16/feb/21 2 hrs	Topic 3: Construction and operations of lists 3.1 Explain the syntax for the creation of the different types of lists and their elements,	Presentation and practices by the teacher			
19/feb/21 2 hrs		Activities and practices by the students			

	using the object-oriented paradigm.				
22/feb/21 2 hrs	3.2 Create lists and their operations from an object-oriented approach	Practices by the teacher and students			
23/feb/21 2 hrs		Practices by the students			
26/feb/21 2 hrs	Unit 4 Topic 1: Definition of Stacks 1.1 Identify the concept of the Stacks , its characteristics and its terminology. 1.2 Demonstrate the use of the stack data structure.	Activitys by the students			
01/mar/21 2 hrs		Practices by the students			
02/mar/21 2 hrs	Topic 2: Types of implementation .2.1 Identify the ways in which a pila can be implemented (arrays and lists) .2.2 Determine in which cases it is pertinent to use pila data structure	Presentation and practices by the teacher			
05/mar/21 2 hrs		Practices by the students			
08/mar/21 2 hrs	Topic 3: Stacks operations 3.1 Identify the syntax of the operations of a pila (push, pop, is_empty, full). 3.2 Prepare Stacks from an object-oriented approach by applying their operations.	Presentation and practices by the teacher			
09/mar/21 2 hrs		Practices by the students			
12/mar/21 2 hrs	Second unit test	Second unit test			
Horas: 30					**Evaluation Date: 12/mar/21**

Evaluation Planner for Unit #3					
Session number / Date	**Topics / Subtopics**	**Teaching- Learning Strategies**	**Educational Sources**	**Evaluation Tools for Learning Outcomes**	**Evaluation Criteria of the Unit**
16/mar/21 2 hrs	**Unit 5:** **Topic 1:** **Definition of queues** 1.1 Identify the concept of queues, its characteristics and terminology 1.2 Illustrate the use of the queues data structure.	Presentation by the teacher and activities by the students	• Computer • Office • Phyton	• Rubric • Reactive	**Know how to do and be 70%** Participation 5% Task 5% Assistance: 10% Practices 30% Learning result 20% **Know and be 30%** Theoretical Exam: 10% Practice Exam: 20%
19/mar/21 2 hrs	Topic 2: Types of implementation 2.1 Identify the ways in which a queues can be implemented (arrangements and lists). 2.2 Determine in which cases it is pertinent to use the queues data structure.	Activities by the students			
22/mar/21 2 hrs		Explain by the teacher			
23/mar/21 2 hrs		Practices by the students			
26/mar/21 2 hrs	Topic 3: Operations with colas 3.1 Identify the syntax of the operations of a queues (Insertion and extraction). 3.2 Make queues from an object-oriented approach by applying your operations	Practices by the teacher			
12/abr/21 2 hrs		Practices by the students			

13/abr/21 2 hrs	Unit 6: Topic 1 Definition and types of tree 1.1 Identify the concept of a binary, balanced binary, search and general tree, its characteristics and terminology. 1.2 Demonstrate the use of the tree data structure and its types	Explain by the teacher and practices			
16/abr/21 2 hrs	Topic 2 Balanced and search Binary trees 2.1 Identify the cases in which it is pertinent to use binary, balanced binary and search trees. 2.2 Identify the operations for binary, balanced binary, and search trees: insertion, elimination, search (depth, amplitude) and routes (preorder, inorder and postorden) 2.3 Elaborate binary, balanced binary and binary search trees, from an object-oriented approach, using basic operations, solving problems that use this type of structure.	Explain by the teacher and activities by the students			
19/abr/21 2 hrs		Practices by the students			
20/abr/21 2 hrs	Topic 3 General trees 3.1 Identify the cases in which it is pertinent to use the general trees. 3.2 Identify the operations for general trees: insertion, elimination, search (depth, amplitude) and routes 3.3 Develop code for general trees in the solution of applications from an object-oriented approach.	Explain by the teacher and activities by the students			

23/abr/21 2 hrs	Topic 4 Conversion of general trees to binaries 4.1 Identify the procedure to convert a general tree to binary. 4.2 Convert general trees into binaries	Explain by the teacher and activities by the students			
26/abr/21 2 hrs	Third unit test	Third unit test			
Horas: **26**					**Evaluation Date:** **26/abr/21**

Evaluation Criteria

Criteria	Minimum Accreditation
Attendance	85%
Portfolio of Evidences	Approved
Unit outcomes	3
Minimum grade	SA (8)

MTIC. Miguel Ángel Rodriguez Negrete
Developed
Teachers

M.E.E Susy Mercado Avilés
Checked
Academy Coordinator

Juan Meza Álvarez
Received
Group Leader(s)

RECIBIDO
COORDINACIÓN GENERAL DE ACADEMIAS

Seal
General Coordination of Academies