Date:	Examination No.:	Version:2023-2024	Start:1/9/2023
Module Name - Code	Data Structure and Algorithms - 5111		
Module Language:	English		
Responsible:	Kanar Shukr Muhamad		
Lecture (s):	None		
College:	College of Engineering – Salahaddin University-Erbil		
Duration:	15 week – 1 semester		
Course outcomes:	This course is a mandatory requirement for the BSc in Software Engineering. It provides an introduction to many of the basic data structures used in computer software, Analyze the algorithms that use them and to apply them by writing programs. (Although a review of the necessary basic programming notions is included). - Students will understand • what the tools are for storing and processing common data types • which tools are appropriate for which? - At the end of this course, students will be able to: • Justify your design decisions via formal reasoning • Communicate ideas about programs clearly and precisely. • Describe the data structures used in computer systems, how data is stored and retrieved in each structure (accessing protocols). • Write good algorithms with minimum cost analyze algorithms and compare them to choose the best one. • Know all sorting algorithms. • Understand the searching technique.		
Course Content:	- Introduction to the course and data structure concepts and mechanisms - Structure Mapping Function - Asymptotic Complexity - Abstract Data Type • Stack • Queue • Circular Queue - Pointer and heap memory. • Single Linked List • Double Linked List		

	- Tree Data Structure - Searching and Sorting Algorithms
Literature:	The following references are recommended: - Data Structures, Algorithms and Application in C++ by S. Sahni, any edition - Data Structure and Programming Design in C++ by Krurse and Ryba, Prentice Hall, any edition. - Algorithms and Data Structures by Kurt Mehlhorn and Peter Sanders, any edition. - Advanced Data Structures by Prof. Erik Demaine, Notes Collection. - Fundamentals of Data Structures by Ellis Horowitz and Sartaj Sahni - Notes on Data Structures and Programming Techniques by James
Type of Teaching:	4 hours in lectures - 2 hours theory - 2 hours practical
Pre-requisites:	
Preparation Modules:	
Frequency:	Autumn Semester
Requirements for credit points:	For the award of credit points, it is necessary to pass the module exam. Student's attendance is required in all classes.
Credit point:	5
Grade Distribution:	For the award of credit points, it is necessary to pass the module exam. It contains: - % 50 Work Load includes Theory and Practical: (Activities, quizzes, normal Exam,….) - %30 Theory Final Exam - %20 Practical Final Exam - Student's attendance is required in a class
Work load:	The workload is 150 hrs. It is the result of 60 hrs. attendance and 90 hrs. self-studies (Assignments, preparation for exam and applications).