Department of Mathematics

College of Education

University of Salahaddin

Subject:Algorithm

Course Book – (Year 1)(second Course)

Lecturer's name Ferman Ali Ahmed

Academic Year: 2021/2022

Course Book

1. Course name	Algorithm
2. Lecturer in charge	Ferman Ali Ahmed
3. Department/ College	Mathematics / Education
4. Contact	e-mail: ferman.ahmed@su.edu.krd Tel: 07504753287
5. Time (in hours) per week	Theory: 2 hours
6. Office hours	Monday 10-12 am Tuesday 10-12 am
7. Course code	
8. Teacher's academic profile	2003-2007 BSc. of the mathematics Department of Mathematics College of Education University of Salahaddin-Hawler Erbil Kurdistan Region Iraq 2012-2013 MRes of the mathematics Department of Mathematics University of Leicester UK
9. Keywords	Algorithm

10. Course overview:

A computer program is a sequential set of instructions written in a computer language that is used to direct the computer to perform a specific task of computation. Observe that the definition demands that any set of instructions must be such that the tasks will usually be performed sequentially unless directed otherwise. Each instruction in the set will express a unit of work that a computer language can support. In general, high level languages, also known as 3GLs, support one human activity at a time. For example, if a computational task involves the determination of the average of three numbers, then it will require at least three human activities, viz., getting the numbers, obtaining the sum of the numbers, and then obtaining the average. The process will therefore require three instructions in a computer language. However, it can be done using two instructions, also: first by obtaining the numbers and second by obtaining the sum and the average.

11. Course objective:

The objective of programming is to solve problems using computers quickly and accurately. A problem is something the result of which is not readily available. A set of steps involving arithmetic computation and/or logical manipulation is required to obtain the desired result. There is a law called the law of equifinality that states that the same goal can be achieved through different courses of action and a variety of paths, so the same result can be derived in a number of ways. For example, consider the task of sending a message to one of your friends. There are many ways in which this can be done. First, you can convey the message over the phone if your friend possesses a phone. Second, you can send it by post. Third, you can send it through a courier service. If the message is urgent, then you can try to use the quickest means for sending it. If it is not urgent, then you will choose to send it in the least expensive but most reliable way of doing it. Depending upon the urgency, you will decide the most effective way of doing it. This most effective way is called the optimum way. The different ways of solving a problem are called solution strategies. The optimum way of solving a problem to get the desired result can be achieved by analyzing different strategies for the solution and then selecting the way that can yield the result in the least time using the minimum amount of resources. The selection process will depend on the efficiency of the person and his/her understanding of the problem. He/she must also be familiar with different problem-solving techniques. Determining the set of steps required to solve a given problem is an art. It shows how well a person can arrange a set of steps so that others can follow it. A type of analysis called task analysis is required to reach the solution from a problem definition that states what is to be achieved.

12. Student's obligation

in this year we take some quiz ,the student must prepare report and take two assignments, determine the active students.

13. Forms of teaching

Different forms of teaching will be used to reach the objectives of the course: power point presentations for the head titles and definitions ,figure and summary of conclusions, classification of materials and any other illustrations.

14. Assessment scheme

Midterm Examination	30 %
Course work and assignments	10 %
Final Examination	60 %.
Total Marks	100%

15. Student learning outcome:

- Understand the abstract method that such code describes is what we call an algorithm. The aim of algorithmic problem solving is thus to, given a computational problem, devise an algorithm that solves it.
- They define a method that uses the input to a problem in order to produce the correct output.
- Develop a procedure to construct algorithm and flow chart of their problem.
- Using this, a processor implements machine code, such as the x86 instruction set. Machine code is often written using a higher-level syntax called Assembly. While some code is written in this rather low-level language, we mostly abstract away details of them in high-level languages such as C++ (this book's language of choice)

16. Course Reading List and References:

* A. B. Chaudhuri, Flowchart and Algorithm Basics, MERCURY LEARNING AND INFORMATION,2020.

* Mark A. Weiss. Data Structures and Algorithm Analysis in C++. Pearson, 2013.		
17. The Topics:		**Lecturer's name**
1	Chapter One FLOWCHARTING AND ALGORITHMS Defining flowchart and algorithm.	Ferman Ali
2	The rules should be followed while creating program flowcharts.	Ferman Ali
3	Drawing a flowchart to show how the sum, product and average of two numbers can be obtained.	Ferman Ali
4	Constructing a flowchart to show how to obtain the volume of a rectangular box.	Ferman Ali
5	Developing a flowchart to show the steps in finding the simple interest on a given amount at a given rate of interest.	Ferman Ali
6	Chapter Two PROBLEMS INVOLVING SELECTION • problems involving decision-making • A predicate is tested to see if it is true or false. If it is true, a course of action is specified for it; if it is found to be false, an alternative course of action is expressed.	Ferman Ali
7	Developing a flowchart to show how the profit or loss for a sale can be obtained and determine whether a given number is even or odd.	Ferman Ali
8	Constructing a flowchart to show how the net payable amount is determined.	Ferman Ali
9	Exam	Ferman Ali
10	Drawing a flowchart to show how to solve a quadratic equation.	Ferman Ali
11	Calculating the bonus for the employees of an organization.	Ferman Ali
12	Constructing a flowchart to show how the greatest of the three given numbers can be obtained.	Ferman Ali
13	Chapter Three PROBLEMS INVOLVING LOOPING Introduction	Ferman Ali
14	Devise a procedure to calculate the commission of the salesmen.	Ferman Ali

15	Devising a procedure to find the sum of first n natural numbers, where n is any given integer, without using a formula.	

18. Practical Topics (If there is any)

In this section The lecturer shall write titles of all practical topics he/she is going to give during the term. This also includes a brief description of the objectives of each topic, date and time of the lecture	Lecturer's name ex: (3-4 hrs) ex: 14/10/2021

19. Examinations:

Q1/ The follow algorithm determine a cash discount of an item. Fill the following comments about this algorithm.

Step 1. INPUT TO P (P represents the price of an item)
Step 2. INPUT TO CHOICE (“S” an item has cash discount and “N” an item has no cash discount)
Step 3. IF CHOICE = “S” [ ]

THEN COMPUTE Dis ← P*0.13 [ ]

ELSE COMPUTE Dis ← 0 [ ]
END-IF

COMPUTE CP ← P-Dis [ ]

Step 4. PRINT CP [ ]
Step 5. STOP

Q1/ Construct a flowchart to show how to obtain the volume of a rectangular box.
Q2/ Write an algorithm to show how a student’s registration number and grades in 3 subjects, m1, m2, and m3, are displayed along with the total average grade.
Q3/ Develop a flowchart to show how the profit or loss for a sale can be obtained.

20. Extra notes:

21. Peer review پێداچوونەوەی هاوەڵ

Hemin A. Ahmad
Assistant Lecturer.