



Course Specification of Programming Fundamentals

Course No (.....)

2020/2021

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Academic Development center and Quality
Dr. Ahmed Al-shalabi	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad
Rector of Sana'a University			
Prof. Dr. Qassim Mohammed Abbas			



I. Course Identification and General Information:						
1	Course Title:	Programming Fundamentals				
2	Course Code & Number:				
3	Credit hours:	C.H				
		Th.	Seminar	Pr	Tr.	TOTAL
		2	-	2	-	3
4	Study level/ semester at which this course is offered:	1 st Level – 2 nd Semester				
5	Pre –requisite (if any):	Introduction to Computer (Problem Solving)				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	CS				
8	Language of teaching the course:	English/Arabic				
9	Study System	Term based system				
10	Mode of delivery:	Full Time				
11	Location of teaching the course:	Faculty of Computer and Information Technology				
12	Prepared By:	Dr. Musa Ghurab				
13	Date of Approval					

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II. Course Description:

This is an introductory course on the fundamentals of computer programming. It focuses on introduction to computer programming languages topics with an emphasis to use it to solve mathematical and scientific problems. It introduces the principles of procedural programming, data types, variables declarations, constants variables, memory locations, arithmetic operations, input and output operations, Sequences statements, Selection statements, Iteration statements and one-dimensional array. The course helps student to design, write, and implement computer programs.

III. Course Intended learning outcomes (CILOs) of the course (maximum 8CILOs)		Reference PILOs (Only write code number of referenced Program Intended learning outcome)
a1.	Describe the principles of programming language.	A3
a2.	Explain the fundamentals of different structure in programming language.	A4
b1.	Formulate the essential facts, concepts and principles related to logic of computer programming statements	B1, B2
b2.	Design a simple problem solving and tools using programming language.	B4
c1.	Practice algorithmic problem solving using different techniques.	C2
c2.	Implement structured programming, control constructs, arrays and loops in solving problems using programming language	C3

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d1.	Work effectively both in a team and independently	D1
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(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Describe the fundamentals of principles of programming language.	Lectures Tutorials	Assignments, Exams Quiz
a2- Explain the fundamentals of different structure in programming language.	Lectures Tutorials	Assignments, Exams Quiz

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Formulate the essential facts, concepts and principles related to logic of computer programming statements	Lectures	Assignments, exams, experimental write tech reports, project reports

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b2- Design a simple problem solving and tools using programming language.	Lectures Tutorials Seminars Problem solving	Assignments, exams, experimental write tech reports, project reports
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(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Practice algorithmic problem solving using different techniques.	Tutorials problem solving case study Lab	Mid-term exam Final exam Quiz
c2- Implement structured programming, control constructs, arrays and loops in solving problems using programming language	Tutorials problem solving case study Lab	Mid-term exam Final exam Quiz

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Work effectively both in a team and independently	Working in group	Small project

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IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction	a1	History of programming languages. Low-level languages and High-level languages.	1	2
2	Problem solving	a1, a2, b2, c1	Flowcharts and pseudocode algorithms.	1	2
3	Introduction to C/C++ programming language.	a2, b1, c2	History of C/C++ C++ standard Library. C++ Environment. General structures of C/C++ programming language. Data types. Variables declaration/definition. Directives. Inputs and outputs. Simple programming.	4	8
4	Arithmetic and operators	a1, a2, b1, c1	Arithmetic operators. Operator's precedence. Equality and relational operators. Sequences.	1	2

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5	Control Structures	a1, a2, b1, b2, c1, c2	Selection and Decisions: if if...else. nested if switch	2	4
6	Control Structures	a1, a2, b1, b2, c1, c2	Iteration: for while do while	3	6
7	array	a1, a2, b1, c2	Array definition (one-dimensional array). operations on array (add, subtraction, multiplication and invers of array).	2	4
Number of Weeks /and Units Per Semester				14	28

B - Practical Aspect: (if any)				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Problem solving and Algorithms	1	2	a1, a2, b2, c1
2	Introduction to C/C++ Integrated development Environments (IDE).	1	2	a1
3	Introduction to C/C++ programming.	2	4	a2, b1, c2

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	Writing simple programs that involve using input/output statements. identify and fix common syntax errors.			
4	Data type, Operators, and Expressions	2	4	a2, b3, c2
5	Control structure writing program using if, if..else, switch, for, while & do...while control structure	4	8	a1, a2, b1, b2, c1, c2
6	Array (one-dimensional array). Operations on array	3	6	a1, a2, b1, c2
Number of Weeks /and Units Per Semester		13	26	

V. Teaching strategies of the course:

- Lectures
- Tutorials
- Problem solving
- Lab
- Case study
- Small project

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Design algorithm to solve simple problem	a1, b2, c1, c2	3 rd	1
2	Write simple program (using: Sequence).	a1, b2, c1, c2	6 th	2

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Vice Dean for Quality Assurance

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Dean of the Faculty

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3	Write simple program (using: Sequence, Selection, Iterations).	a1, b2, c1, c2	10 th	2
4	Design and Implement small project.	a1, a2, b1, b2, c1, c2, d1	15 th	5

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	3 rd , 6 th , 10 th	5	5%	a1, b2, c1, c2
2	Small project	15 th	5	5%	a1, a2, b1, b2, c1, c2, d1
3	Lab exams	7 th , 15 th	20	20%	a1, a2, b1, b2, c1, c2, d1
4	Mid Term Exam	8 th	10	10%	a1, a2, b1, b2 c1, c2
5	Final Exam	16 th	60	60%	a1, a2, b1, b2, c1

VIII. Learning Resources:

- Written in the following order: (Author - Year of publication - Title - Edition - Place of publication - Publisher).

1- Required Textbook(s) (maximum two).

- Deitel & Deitel, 2017, "**C++ How to Program**", Tenth Edition, Pearson Education
- D. S. Malik, 2018, "**C++ programming from Problem Analysis to Program Design**", Eighth Edition, Cengage Learning.

2- Essential References.

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	1-Stanley B Lippman; Josée Lajoie; Barbara E, 2013, " C++ PRIMER ", 5 th Edition, Addison-Wesley
3- Electronic Materials and Web Sites etc.	
	1- http://www.cplusplus.com/ 2- https://www.w3schools.com/cpp/

IX. Course Policies:	
Unless otherwise stated, the normal course administration policies and rules of the Faculty of Computer and Information Technology apply. For the policy, see: ----- ----- The University Regulations on academic misconduct will be strictly enforced. Please refer to -----	
1	Class Attendance: A student should attend not less than 75 % of total hours of the subject; otherwise he will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring a proof statement from university Clinic
2	Tardy: For late in attending the class, the student will be initially notified. If he repeated lateness in attending class, he will be considered as absent.
3	Exam Attendance/Punctuality: A student should attend the exam on time. He is Permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam.
4	Assignments & Project The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time.
5	Cheating: For cheating in exam, a student will be considered as fail. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty.

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6	<p>Plagiarism: Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proofed a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Council Affair of the university.</p>
7	<p>Other policies:</p> <ul style="list-style-type: none"> - Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room - Mobile phones are not allowed in class during the examination. - Lecture notes and assignments my given directly to students using soft or hard copy

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Faculty of Computer & Information Technology

Department of Computer Science

Program of Computer Science

Course Syllabus of Programming Fundamentals

Course No (.....)

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I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:																			
1-	Course Title:	Programming Fundamentals																	
2-	Course Number & Code:																	
3-	Credit hours:	<table border="1"> <thead> <tr> <th colspan="4">C.H</th> <th rowspan="2">Total</th> </tr> <tr> <th>Th.</th> <th>Seminar</th> <th>Pr.</th> <th>F. Tr.</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>-</td> <td>2</td> <td>-</td> <td>3</td> </tr> </tbody> </table>				C.H				Total	Th.	Seminar	Pr.	F. Tr.	2	-	2	-	3
C.H				Total															
Th.	Seminar	Pr.	F. Tr.																
2	-	2	-	3															
4-	Study level/year at which this course is offered:	1 st Level – 2 nd Semester																	
5-	Pre –requisite (if any):	Introduction to Computer (Problem Solving)																	
6-	Co –requisite (if any):	None																	
7-	Program (s) in which the course is offered	CS																	
8-	Language of teaching the course:	English/Arabic																	
9-	System of Study:	Term based system																	
10-	Mode of delivery:	Full Time																	
11-	Location of teaching the course:	Faculty of Computer and Information Technology																	

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III. Course Description:

This is an introductory course on the fundamentals of computer programming. It focuses on introduction to computer programming languages topics with an emphasis to use it to solve mathematical and scientific problems. It introduces the principles of procedural programming, data types, variables declarations, constants variables, memory locations, arithmetic operations, input and output operations, Sequences statements, Selection statements, Iteration statements and one-dimensional array. The course helps student to design, write, and implement computer programs..

IV. Intended learning outcomes (ILOs) of the course:

a1.	Describe the principles of programming language.
a2.	Explain the fundamentals of different structure in programming language.
b1.	Formulate the essential facts, concepts and principles related to logic of computer programming statements
b2.	Design a simple problem solving and tools using programming language.
c1.	Practice algorithmic problem solving using different techniques.
c2.	Implement structured programming, control constructs, arrays and loops in solving problems using programming language
d1.	Work effectively both in a team and independently

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V. Course Content:			
<ul style="list-style-type: none"> Distribution of Semester Weekly Plan of Course Topics/Items and Activities. 			
A – Theoretical Aspect:			
Order	Topics List	Week Due	Contact Hours
1	Introduction	1 st	2
2	Problem solving	2 nd	2
3	Introduction to C/C++ programming language.	6 th	8
4	Arithmetic and operators	7 th	2
5	Mid-term Exam	8 th	2
6	Control Structures	10 th	4
7	Control Structures	13 th	6
8	array	15 th	4
9	Final Exam	16 th	2
Number of Weeks /and Units Per Semester		16	32

B – Practical Aspect: (if any)			
Order	Topics List	Week Due	Contact Hours
1	Problem solving and Algorithms	1 st	2

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2	Introduction to C/C++ Integrated development Environments (IDE).	2 nd	2
3	Introduction to C/C++ programming. Writing simple programs that involve using input/output statements. identify and fix common syntax errors.	4 th	4
4	Data type, Operators, and Expressions	6 th	4
5	Mid-term exam	7 th	2
6	Control structure writing program using if, if..else, switch, for, while &do...while control structure	11 th	8
7	Array (one-dimensional array). Operations on array	14 th	6
8	Final- exam	15 th	2
Number of Weeks /and Units Per Semester		15	30

VI. Teaching strategies of the course:

- Lectures
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VII. Assignments:			
No	Assignments	Week Due	Mark
1	Design algorithm to solve simple problem	3 rd	1
2	Write simple program (using: Sequence).	6 th	2
3	Write simple program (using: Sequence, Selection, Iterations).	10 th	2
4	Design and Implement small project.	15 th	5

VIII. Schedule of Assessment Tasks for Students During the Semester:				
Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Assignments	3 rd , 6 th , 10 th	5	5%
2	Small project	15 th	5	5%
3	Lab exams	7 th , 15 th	20	20%
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IX. Learning Resources:
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اللجنة الإشرافية			
م.	الاسم	الصفة	التوقيع
١	أ.م.د. عبد الماجد الخليدي	نائب عميد الكلية للشؤون الأكاديمية	
٢	أ.م.د. احمد مجاهد	نائب عميد مركز التطوير الأكاديمي وضمان الجودة	
٣	د. حسين الأشول	ممثل المركز في الكلية	
٤	أ.د. إبراهيم المطاع	نائب رئيس الجامعة للشؤون الأكاديمية	

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