

Course Specifications



Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications (CS)



Course Specifications

Institution	Date of Report
Najran University	17 / 2 / 2015
College/Department :	
College of Science and Arts Sharourah/ Department of	Computer Science

A. Course Identification and General Information

1.	. Course title and code:					
	Title: Structured Programming Using C++ Code: 202CS-4 (۲۰۲ عال-۲)					
2.	2. Credit hours : 4					
3.	B. Program(s) in which the course is offered.					
	(If general elective available in many programs indicat	e this rather than list programs)				
	Computer Science Program					
4.	. Name of faculty member responsible for the course					
	Dr. Makarem Mohammed Bamatraf					
5.	5. Level/year at which this course is offered:					
	Level 2 /First Year					
6.	5. Pre-requisites for this course (if any)					
	101CS-4 (Introduction to Computers and IT)					
7.	. Co-requisites for this course (if any)					
	None					
8.	3. Location if not on main campus					
	Male and Female Branches					
9.	0. Mode of Instruction (mark all that apply)					
	a Traditional classroom	at percentage?				
	b. Blended (traditional and online) What What What What What What What What	t percentage?				
	c. e-learning with					
	d. Correspondence What	at percentage?				
	f. Other What percentage?					
Co	Comments:					



B Objectives

1. What is the main purpose for this course?

The main purposes of this course are to make student able to:

- 1) Memories general principles of programming languages.
- 2) Apply general principles of programming languages using C++.
- 3) Design suitable solutions for problems using programming principles.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

This course covers introduces students to the fundamentals of structured programming using C++ language. The following topics: Basic components of C++ language such as Symbols, Keywords, variables, constants, expressions, assignment statement, increment and decrement operations. Input/output functions. Conditional statements, repetition statements, arrays and strings, functions, pointers and structures. Using pointers for call by value and call by reference.

1. Topics to be Covered				
List of	Topics	No. of Weeks	Contact Hours	
Introdu	ction:			
1)	What is the meaning of program and Structured programming.			
2)	Specifications of C++ as a programming language.			
3)	Transforming a high level program into low level program	1	3	
	(Editing – Compiling – executing)	1	5	
4)	Concept of problem solving using flow charts.			
5)	General form of C++ program.			
6)	Input and output statements (cin, cout) and using endl.			
Basic c	omponents of C++ language			
1)	Symbols			
2)	Keywords			
3)	Variables: Naming rules and Data Types			
4)	Constants	2	6	
5)	Expressions: mathematical and logical expression: Operations and			
	priority rules.			
6)	Assignment statement			
7)	Increment and decrement operations			
C++ I/0	O more details			
1)	Input/output more special characters.	1	3	
2)	Output manipulation library iomanip.h (serw(), setprecision())			



Condition	al Statements		
1) "i	f" statement		
2) "i	f" statement with "else"	2	6
3) N	ested "if" and "else" statements		
4) "s	witch" statement		
Repetition	h Statements:		
1) "f	or" statement		
2) "v	vhile" statement	C	6
3) "d	lo while" statement	Z	0
4) "c	continue" and "break" commands		
5) C	onversion from "for" to "while" and vice versa.		
Arrays and	d Strings		
1) St	ring data type	C	6
2) O	ne dimensional array	Z	0
3) T	wo dimensional array		
Functions	in C++		
1) T	he Concept of function		
2) Li	ibrary functions, for example mathematical functions.		
3) U	ser defined functions		
	a. Definition of function name, type of arguments and return	3	6
	values.		
	b. Global and local variables in side functions or		
	immediately declared after include statement.		
	c. Function prototype		
Pointers a	nd Structures		
1) Po	pinter type		
	a. Meaning of pointers		
	b. Declation of pointers		
	c. Using mathematical operations (++,, +, -) with pointers		
	d. Using pointers for call by reference in functions (call by	C	6
	value vs. call by reference)	Z	0
2) St	ruct type		
	a. Meaning of struct		
	b. Definition of struct		
	c. Using struct as an argument to functions		

1. Topics to be Covered in Lab				
List of Topics	No. of Weeks	Contact Hours		
 Introduction: 1) Structure of a C++ program (iostream library for supporting input/output) with main() function. 2) Editing, compiling and running hello program using cin and cout statements with endl emphasis for cout. 	1	2		



Basic components of C++ language		
1) Variables:		
a. Declaring data types (int, long int, short int, float, char,		
bool, singed, unsigned)		
b. Example of errors arises when violating naming rules.		
2) Declaring constants (using const and define)		
3) Expressions: mathematical and logical expression:		
a. Operations $(+, -, *, /, \%, \&\&, \parallel, !, ==, >, <>=, <=,$	2	4
!=)		
b. Practice priority rules of operations.		
4) Assignment statement (=)		
a. The form $x = 5$ (single assignment)		
b. The form $x = y = z = 5$ (compound assignment)		
5) Increment and decrement operations (++,)		
C + 1/O more details		
1) Input/output special characters $(\langle n, \langle t, \langle \rangle, \langle \rangle)$ to be used in	1	2
examples for managing output consul screen.		
2) Output manipulation library iomanip.n (serw(), setprecision())		
Londitional statements		
1) 11 statement	2	4
2) If statement with else 2) Nexted "fill and "statements	2	4
5) Nested 11 and else statements () "ewitch" statement		
4) Switch Statements		
1) "for" statement		
1) 101 Statement		
2) while statement	2	4
4) "continue" and "break" commands		
4) Commute and Dieak Commands 5) Conversion from "for" to "while" and vice verse		
Arrays and Strings		
1) String data type		
2) One dimensional array	2	4
3) Two dimensional array		т
4) Examples on manipulating string and arrays		
Functions in C++		
1) The Concept of function		
2) Library functions (for example mathematical functions) such as:		
(cos(), sin(), floor(), pow(), fmod(), sqrt(), ceil())		
3) User defined functions	2	Α
a. Definition of function name, type of arguments and return	2	4
value (void or typed).		
b. Global and local variables in side functions or		
immediately declared after include statement.		
c. Example Function prototype		



Pointers and Structures		
1) Pointer type		
a. Meaning of pointers		
b. Definition of pointers		
c. Using mathematical operations (++,, +, -) with pointers		
d. Using pointers for call by reference in functions (call by	2	4
value vs. call by reference)	Δ.	4
2) Struct type		
a. Meaning of struct		
b. Definition of struct		
c. Using struct with as an argument to functions		

2. Course components (total contact hours and credits per semester):								
	Lecture Tutorial Laboratory Practical Other: Total							
Contact Hours	45		30			75		
Credit	45		15			60		

 3. Additional private study/learning hours expected for students per week.
 3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

Course Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent agreement between student learning, assessment, and teaching.

The *National Qualification Framework* provides five learning domains. Course learning outcomes are required. Normally a course has should not exceed eight learning outcomes which align with one or more of the five learning domains. Some courses have one or more program learning outcomes integrated into the course learning outcomes to demonstrate program learning outcome alignment. The program learning outcome matrix map identifies which program learning outcomes are incorporated into specific courses.

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated



learning and teaching process. **Fourth**, if any program learning outcomes are included in the course learning outcomes, place the @ symbol next to it.

Every course is not required to include learning outcomes from each domain.

	NQF Learning Domains	Course Teaching	Course Assessment
	And Course Learning Outcomes	Strategies	Methods
1.0	Knowledge		
1.1	Memorize the principles and fundamentals of	Lecture	Written Fxam
	programming languages (C language)	Lecture	Whiten Exum
1.2	Recall the theoretical and practical background	Lecture Practical	Written Exam
	when they need to use.	Lecture, Tractical	Whiten Exam
2.0	Cognitive Skills		
2.1	Uses logical thinking to develop solutions to the		Lab assignments Written
	real life problems using programming languages (C	Laboratory	Exam
	language).		
2.2	Apply experiences and places the appropriate	Laboratory	Lab assignments, Written
	solutions in the field of computer programs.	Laboratory	Exam
3.0	Interpersonal Skills & Responsibility		
3.1			
3.2			
4.0	Communication, Information Technology, Numeri	cal	
4.1	Uses statistical techniques and the basics of	Lecture Laboratory	Lab assignments, Written
	mathematics in programming language.	Lecture, Laboratory	Exam
4.2			
5.0	Psychomotor		
5.1			
5.2			

Suggested Guidelines for Learning Outcome Verb, Assessment, and Teaching

NQF Learning Domains	Suggested Verbs				
Knowledge	list, name, record, define, label, outline, state, describe, recall, memorize reproduce, recognize, record, tell, write				
Cognitive Skills	list, name, record, define, label, outline, state, describe, recall, memorize, reproduce, recognize, record, tell, write estimate, explain, summarize, write, compare, contrast, diagram, subdivide, differentiate, criticize, calculate, analyze, compose, develop, create, prepare, reconstruct, reorganize, summarize, explain, predict, justify, rate, evaluate, plan, design, measure, judge, justify, interpret, appraise demonstrate, judge, choose, illustrate, modify, show, use, appraise, evaluate, justify, analyze, question, and write				
Interpersonal Skills & Responsibility	demonstrate, judge, choose, illustrate, modify, show, use, appraise,				
	evaluate, justify, analyze, question, and write				



Communication, Information	demonstrate, calculate, illustrate, interpret, research, question, operate,
reemology, rumerical	appraise, evaluate, assess, and enticize
Psychomotor	demonstrate, show, illustrate, perform, dramatize, employ, manipulate, operate, prepare, produce, draw, diagram, examine, construct, assemble,
	experiment, and reconstruct

Suggested *verbs not to use* when writing measurable and assessable learning outcomes are as follows:

Consider	Maximize	Continue	Review	Ensure	Enlarge	Understand
Maintain	Reflect	Examine	Strengthen	Explore	Encourage	Deepen

Some of these verbs can be used if tied to specific actions or quantification. Suggested assessment methods and teaching strategies are:

According to research and best practices, multiple and continuous assessment methods are required to verify student learning. Current trends incorporate a wide range of rubric assessment tools; including web-based student performance systems that apply rubrics, benchmarks, KPIs, and analysis. Rubrics are especially helpful for qualitative evaluation. Differentiated assessment strategies include: exams, portfolios, long and short essays, log books, analytical reports, individual and group presentations, posters, journals, case studies, lab manuals, video analysis, group reports, lab reports, debates, speeches, learning logs, peer evaluations, self-evaluations, videos, graphs, dramatic performances, tables, demonstrations, graphic organizers, discussion forums, interviews, learning contracts, antidotal notes, artwork, KWL charts, and concept mapping.

Differentiated teaching strategies should be selected to align with the curriculum taught, the needs of students, and the intended learning outcomes. Teaching methods include: lecture, debate, small group work, whole group and small group discussion, research activities, lab demonstrations, projects, debates, role playing, case studies, guest speakers, memorization, humor, individual presentation, brainstorming, and a wide variety of hands-on student learning activities.

5. Schedule of Assessment Tasks for Students During the Semester				
	Assessment task (e.g. essay, test, group project, examination, speech,	Week Due	Proportion of Total	
	oral presentation, etc.)		Assessment	
1	Mid-term exam	8	20	
2	Quizzes and Assignments	During the semester	10	
3	Mid-Tem Lab Exam	10	10	
4	Final Lab Exam	15	10	
5	Final Exam	At the end of semester	40	
6	Attendance	During the semester	10	



D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

For one credit hours there are three office hours per week for this course.

E. Learning Resources

1. List Required Textbooks

Programming in C++ (Arabic Edition), Dr. Yaser M. et al, 2006. (for syllabus details) The Complete guide to C++ Programming, (for more details and definitions)

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

Lab computer or personal computer with C++ compiler (Div C++ or visual Turbo C).

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

1-Class room with 30seats

2-Computer lab. With 30seats



2. Computing resources (AV, data show, Smart Board, software, etc.)

- 1- Data show with screen.
- 2- Lab computer or personal computer with C++ compiler (Dev C++ or Trubo C visual).

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

 Distribution of a questionnaire for students to know how to achieve the goals in the theoretical and practical side.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor:

- \checkmark Discussions with colleagues who specialize in teaching methods and means of learning.
- \checkmark Self-evaluation of the performance of the teacher.
- \checkmark Discussions with other colleagues who taught this course.

3 Processes for Improvement of Teaching

- \checkmark Diagnose weaknesses and turn them into strengths.
- \checkmark Discussions about the decision and methods of teaching
- \checkmark Study the needs of the labor market of college graduates

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Faculty or Teaching Staff: Dr. Makarem Mohammed Bamatraf

Signature:	Date Report Completed: 17 – 2 – 2015
Received by:	Dean/Department Head
Signature:	Date: