UNIVERSITI TEKNOLOGI MARA
FACULTY OF COMPUTER AND MATHEMATICAL SCIENCES

SCHEME OF WORK PROGRAMMINGII (CSC404)

Week	Content	Hours	Activities
1	**Topic 1 : Pointers** • Introduction to Pointers • Pointer Operations • Pointer Manipulations	2	Lecture/Discussion
	Lab Session • Debug and execute sample program that used pointers • Apply a problem by using pointers	2	Lab session
2	**Topic 2 : Function** • Introduction to function • Function call • Header file • Library function – introduce some common mathematical functions (`abs()`,`sqrt()`, `pow()`) and string functions (`strcpy()`, `strcmp()`)	2	Lecture/Discussion
	Lab Session • Debug and execute sample program that used predefine function • Solve a problem by using function	2	Lab session

3	**Topic continuation:**
	• Types of variable and its scope – block, local & global
	• User-defined function
	  o Function prototype & definition
	  o With/without parameter
	  o Void/returned-value function
	• Parameter passing – passing by value
		2	Lecture/Discussion

	Lab Session • Key-in, compile, run and explain the function with return value • Solve one simple problem using function • Sample program: function passing by value	2	Lab session Assignment 1
4-5	**Topic continuation:** • Parameter passing – passing by reference (**including** nested function) • Apply pointers with functions	4	Lecture/Discussion Quiz 01
	Lab Session • Solve one simple problem using function • Sample program: function passing by reference	4	Lab session
6	**Topic 3 : Array - One-dimensional Array -REVISIT** • Introduction to array • Array declaration and initialization	2	Lecture / Discussion

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	• Dynamic arrays • Input values into array • Accessing elements of an array • Array operations using basic algorithms ○ minimum, maximum, count, total, average, sort (*bubble*), search (*sequential*) •		

	Topic continuation:
	• Array and function
	   ○ Passing array as parameter to function
	   ○ Passing array element as parameter to function
	   ○ Apply Pointers with array
	Lab session:
	• Write programs using one-dimensional array by applying the basic algorithms
	• Write programs using one-dimensional array that passes values to functions
		2	Lab session
			Quiz 02

7	**Topic continuation:**
	Array - Multi-dimensional Arrays
	• Two-dimensional array declaration and initialization
	• Accessing and printing array components
	• Two-dimensional array operations using basic algorithms
	   ○ minimum, maximum, count, total, average, sort (*bubble*), search (*sequential*)
	      ▪ entire array (include sorting)
	      ▪ by row
	      ▪ by column
		2	Lecture /
			Discussion
			
			Discussion on final project

	Lab session: • Compile and execute simple programs using two-dimensional array • Write programs using two-dimensional array by applying the basic algorithms	2	Lab session Assignment 2

8	**Topic continuation:**
	• Two-dimensional array string manipulation
	   ○ Sorting
	   ○ Searching
	• Application of multi-dimensional array
	   ○ Example : matrix, game
	• Two-dimensional Array and function
	   ○ Passing two-dimensional Array as parameter to function
	   Passing two-dimensional Array element as parameter to function
		2	Lecture /
			Discussion
			
			Project Topic given
			
			Test 01

	Lab session:	2	Lab session

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	• Write programs using two-dimensional array by applying the basic algorithms • Write programs using two-dimensional array using parameters		
9	**Topic 4 : Records (`struct`)** • Record definition • Record variable declaration • Accessing record members • Record assignment • Comparing record members	2	Lecture / Discussion
	Lab session: • Write programs that demonstrate the application of record	2	Lab session Assignment 3

10	**Topic continuation:**
	• Records and array
	   o Array of records
	   o Array of record members
		2	Lecture / Discussion

	Lab session: • Write programs that demonstrate the use of array and record	2	Lab session

11	**Topic continuation:**
	• Record and function
	   o Pass record variable as parameter
	   o Pass record member as parameter
	   o Return record
	     ▪ Using parameter
	     ▪ Using returned type
		2	Lecture / Discussion
			
			Quiz03

	Lab session: • Write programs that pass/return record variable and record member to/from function	2	Lab session

12	**Topic 5 : Text Files**
	• Introduce the six step process
	   o include header file `fstream`
	   o declare file object `ofstream`/`ifstream`
	   o open file
	   o check if file is opened successfully
	   o perform operation
	   o close file
		2	Lecture / Discussion

	Lab session: • Compare input/output process from text files and console	2	Lab session Assignment 4
13	**Topic continuation:** • File operation	2	Lecture / Discussion

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	o read data from file o write data into file o display data from file to console			
	Lab session: • Write programs using text files by applying the basic algorithms	2	Lab session	

14	**Topic continuation:**
	• File processing
	  o Read data from file and store into array
	  o Read data as record
		2	Lecture /
			Discussion
			
			Test 02	

	Lab session: • Write programs that combine the usage of array, records and/or files • Discussion and Project Presentation	2	Lab session Project Presentation	
15	**Study Week**			

Assessment

Course Work   : 50%
                        Assignments - 10%
                        Project   - 10%
                        Quizzes   - 10%
                        Tests   - 20%

Final examination   : 50%

Recommended Text

D.S.Malik, *C++ Programming: From Problem Analysis to Program Design*. 6th Edition, Cengage Learning, 2017.

References

1. Liang, Y.D., *Introduction to Programming with C++,* 2nd Edition, Pearson Higher Education, 2014.

2. Farrell, Joyce*, Programming Logic and Design Comprehensive,* 6th Edition, Course Technology, 2014.

3. Zak, Dianne, *An Introduction to Programming with C++,* 6th Edition, Course Technology, 2013.

4. Stroustrop, Bjarne, *The C++ Programming Language,* 4th Edition, Addison Wesley, 2013.