UNIVERSITI TEKNOLOGI MARA

COLLEGE OF COMPUTING, INFORMATICS AND MEDIA

SCHEME OF WORK PROGRAMMINGII (CSC404)

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Week	Content	Hours	Activities
1-2 2 Oct – 15 Oct	**Topic 1 : Pointers** • Introduction to Pointers • Pointer Operations • Pointer Manipulations	4	Lecture/ Discussion
	Lab Session • Debug and execute sample program that used pointers • Apply a problem by using pointers	4	Lab session
3 16 Oct – 22 Oct	**Topic 2 : Function** • Introduction to function • Function call • Header file • Library function – introduce common mathematical functions (`abs()`,`sqrt()`, `pow()`) and string functions ((`strcpy()`, `strcmp()`)	2	Lecture/ Discussion
	Lab Session • Debug and execute sample program that used pre-defined function • Solve a problem by using function	2	Lab session

4
23 Oct – 29 Oct
	Topic continuation:
	• Types of variables and its scope – block, local & global
	• User-defined function
	   o Function prototype & definition
	   o With/without parameter
	   o Void/returned-value function
	   o 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
5-6 30 Oct – 12 Nov	**Topic continuation:** • Parameter passing – passing-by-reference (**Including** nested function) • Apply pointers with functions	4	Lecture/ Discussion

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	Lab Session • Solve one simple problem using function • Sample program: function passing by reference	4	Lab session
Mid-semester Break (13 Nov – 19 Nov 2023)			

7
20 Nov – 26 Nov
	Topic 3 : Array - One-dimensional Array - REVISIT
	• Introduction to array
	• Array declaration and initialization
	• 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*)
	• Array and function
	    ○ Passing array as parameter to function
	    ○ Passing array element as parameter to function
	    ○ Apply Pointers with array
		2	Lecture / Discussion

	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

8
27 Nov – 3 Dec
	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
			
			Test

	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 Discussion on group project

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9
4 Dec – 10 Dec
	Topic continuation:
	• Two-dimensional array string manipulation
	   o Sorting
	   o Searching
	• Application of multi-dimensional array
	   o Example : matrix, game
	• Two-dimensional Array and function
	   o Passing two-dimensional Array as parameter to function
	   o Passing two-dimensional Array element as parameter to function
		2	Lecture /
			Discussion

	Lab session: • Write programs using two-dimensional array by applying the basic algorithms • Write programs using two-dimensional array using parameters	2	Lab session
10 11 Dec – 17 Dec	**Topic 4 : Records (`struct`)** • Record definition • Record variable declaration • Accessing record members • Record assignment • Comparing record members	2	Lecture / Discussion Assignment 2
	Lab session: • Write programs that demonstrate the application of record	2	Lab session
11 18 Dec - 24 Dec	**Topic continuation:** • Records and Array • Array of records • Array of record members	2	Lecture / Discussion
	Lab session: • Write programs that demonstrate the use of array and record	2	Lab session
Special Break (25 Dec 2023 – 1 Jan 2024)			

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12
2 Jan – 7 Jan
	Topic continuation:
	• Record and function
	   o Pass record variable as parameter
	   o Pass record member as parameter
	• Return record
	   o Using parameter
	   o Using returned type
		2	Lecture /
			Discussion

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

13
8 Jan – 14 Jan
	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
	• File Operation
	   o read data from file
	   o write data into file
	   o display data from file to console
		2	Lecture /
			Discussion

	Lab session: • Compare input/output process from text files and console • Write programs using text files by applying the basic algorithms	2	Lab session

14
15 Jan – 21 Jan
	Topic continuation:
	• File processing
	   o Read data from file and store into array
	   o Read data as record
		2	Lecture /
			Discussion

	Lab session: • Write programs that combine the usage of array, records and/or files • Project Presentation	2	Lab session Project Presentation
Study Week (22 Jan – 28 Jan 2024)			

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Assessment

Course Work   : 50%
              Assignments   : 20%
              Project   : 10%
              Test   : 20%

Final examination : 50%

Recommended Text

D.S.Malik, C++ Programming: From Problem Analysis to Program Design. 6th Edition, Cengage Learning, 2013.

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.