

COURSE OUTLINE

Department & Faculty: Dept. of Software Engineering, Faculty of Computing	Page : 1 of 5
Course Code: SCSJ1023 Course Credit: 3 Course Name : Programming Technique II Total Contact Hours: 56 hours Prerequisite Course: Prog. Technique I (SCSJ1013)	Semester: II Academic Session: 2013/2014

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Synopsis : This course equips the students with theory and practice on problem solving techniques by using two approaches, namely the structured approach and the object oriented approach. The first part of the course provides students with basic skills to program in Linux platform and advanced concepts in structured programming techniques including advanced files, pointers and structured data. The second part of the course is to provide students with object-oriented techniques such as class, objects, overloading, aggregation and inheritance.

LEARNING OUTCOMES

By the end of the course, students should be able to:

No.	Course Learning Outcome	Programme Learning Outcome(s) Addressed	Assessment Methods
1.	Analyze problems systematically using structured and object oriented approaches.	PO2 (C4, P3, A2)	LE, Q, A, T, F
2.	Construct or develop C++ programs correctly using advanced structured and object oriented features such as pointers, files, aggregation and inheritance.	PO1 (C3, P3, A2)	LE, Q, A, T, PR, F
3.	Solve problems in a given time frame using C++ programming language and tools.	PO1 (C3, P3, A2)	Sbt, A, T
4.	Work in a team to develop a medium to complex program as a group mini project, using C++ programming language.	PO6 (TS1- TS3)	PR, A, Pr, Peer
5.	Communicate mini project deliverables in writing and oral presentation.	PO6(CS1, CS3, CS4)	Pr, A, PR
(T – Test ; Q – Quiz; LE – Lab exercise ; Sbt - Skill-Based Test; A – Assignment; Peer – Peer assessment; PR – Project ; Pr – Presentation, F – Final Exam)			

Prepared by: Name: Dr. Dayang Norhayati Abang Jawawi Signature: Date: 28 October 2008	Certified by: (Course Panel Head) Name: Signature: Date:
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STUDENT LEARNING TIME

Teaching and Learning Activities			Student Learning Time (hours)	
Face to face Learning	• Lecturer Centered	Lecture	28	
	• Student Centered	- Practical/Lab/Tutorial	24	
		- Student Centered Activity	4	
	• Others		0	
Sub Total			56	
Self Learning	• Non Face to face or Student Centered Learning (SCL)		16	
	• Revision		14	
	• Assessment Preparation		19	
	• Others		0	
	Sub Total			49
Formal Assessment	• Continuous Assessment		12	
	• Final Examination		3	
	• Others		0	
	Sub Total			15
TOTAL SLT			120	

TEACHING METHODOLOGY

Lecture and Discussion, Lab Activities, Co-operative Learning, Mini Project, Presentation, Independent Study

WEEKLY SCHEDULE

Week	Topics	Activities/hours
Week 1	1.0 Software development and Programming Principles	
	1.1 Software engineering	Lecture : 2
	1.2 Software development methods	Lab: 2
	1.3 Program development	
	1.4 Programming issues	
	1.5 Revision on C++ Programming Language	
	1.5.1 Selection and Repetition	
Week 2	2.0 Introduction to Linux and Revision on C++ Programming Language	
	2.1 Linux introduction	Lecture : 2
	2.1.1 X-Windows	Lab: 2
	2.1.2 Basic commands	

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	2.2 Revision on C++ Programming Language 2.2.1 Function	
Week 3	3.0 C++ Programming in Linux environment 3.1 GNU Compiler Collection 3.2 VI editor 3.3 Revision on C++ Programming Language 3.3.1 1-dimensional Array 3.3.2 2-dimensional Array	Lecture : 2 Lab: 2 Assessment: <i>Quiz 1</i> <i>Lab exercise 1</i>
Week 4	4.0 String and String Manipulation 4.1 Character Testing 4.2 Character Case Conversion 4.3 The C-Strings 4.4 String/Numeric Conversion Functions 4.5 The C++ string Class	Lecture : 2 Lab: 2 Assessment: <i>Lab exercise 2</i>
Weeks 5	5.0 Advanced File Operations 5.1 File Operations 5.2 File Output Formatting 5.3 Passing File Stream Objects to Functions 5.4 Member Functions for Reading and Writing Files 5.5 Multiple Files 5.6 Binary Files 5.7 Creating Records with Structures 5.8 Random-Access Files 5.9 Opening a File for Both Input and Output	Lecture : 2 Lab: 2 Assessment: <i>Lab exercise 3</i>
Week 6-7	6.0 Pointers 6.1 Address of a Variable 6.2 Pointer Variable 6.3 The Relationship Between Arrays and Pointers 6.4 Pointer Arithmetic 6.5 Initializing Pointers 6.6 Comparing Pointers 6.7 Pointers as Function Parameters 6.8 Dynamic Memory Allocation 6.9 Returning Pointers from Functions	Lecture : 4 Lab: 4 Student Centered Learning : 1 Assessment: <i>Assignment 1</i> <i>Skill-based Test 1</i>
Week 8	SEMESTER BREAK	

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Week 9-10	7.0 Structured Data 7.1 Abstract data types 7.2 Combining Data into Structures 7.3 Accessing Structure Members 7.4 Initializing the Structure 7.5 Arrays of structures 7.6 Nested Structures 7.7 Structures as Function Arguments 7.8 Returning a Structure from a Function 7.9 Pointers to Structures 7.10 Unions 7.11 Enumerated Data Types	Lecture : 4 Lab: 4 Assessment: <u>Midterm Test:</u> Assignment 2
Weeks 11-12	8.0 Introduction to Class 8.1 Procedural and Object-Oriented Programming 8.2 Introduction to Classes 8.3 Defining an Instance of a Class 8.4 Private Members 8.5 Separating Class Specification from Implementation 8.6 Inline Members Functions 8.7 Constructors 8.9 Passing Arguments to Constructors 8.10 Destructors 8.11 Overloading Constructors 8.12 Private Members Functions 8.13 Arrays of Objects 8.14 The Unified Modelling Language (UML)	Lecture : 4 Lab: 4 Student Centered Learning : 1 Assessment: Project (Phase 1) <u>Quiz 2</u> Project (Phase 2) <u>Skill-based Test 2</u>
Week 13	9.0 Class and object Manipulation 9.1 Instance and Static Members 9.2 Friends of Classes 9.3 Member wise Assignment 9.4 Copy Constructors 9.5 Operator Overloading 9.6 Object Conversation	Lecture : 2 Lab: 2 Assessment: Project (Phase 3) Lab exercise 4
Week 14	10.0 Aggregation and Inheritance 10.1 Introduction to Aggregation 10.2 Introduction to Composition 10.3 Aggregation and Composition Implementation 10.4 Introduction to Inheritance 10.5 Protected Members and Class Access 10.6 Constructors and Destructors in Base and Derived Classes 10.7 Redefining Base Class Functions 10.8 Class Hierarchies	Lecture : 2 Lab: 2 Assessment: <u>Skill-based Test 3</u>
Week 15	Project Presentation	Project (Phase 4)

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Week 16 **STUDY WEEK (25 May - 31 May 2014)**

Week 17 **EXAMINATION WEEKS (1 June – 21 June 2014)**

REFERENCES : Text Book:

1. Tony Gaddis, *Starting out with C++ : From Control Structures to Objects* , 7th ed. Brief Version, 2012. Pearson Education.

Lab Book:

1. Faculty of Computer Science and Information Systems, *Programming Technique II – C++ Workbook (English – Malay)*, 3rd edition, 2010.

Reference Book/Material:

1. Malik D.S. *C++ Programming: From Problem Analysis to Program Design*, 6th edition. 2012. Cengage Learning.
2. Deitel P., Deitel H. *C++ How to Program : Late Objects Version*, 8th ed. 2012. Pearson Education
3. Walter Savitch, *Problem Solving with C++*, 8th edition. 2012. Pearson (Addison-Wesley).
4. Behrouz A.Forouzan, Richard F.Gilberg, *Computer Science: A Structured Approach Using C++*, 2nd edition. 2004. Brooks/Cole Thomson Learning.

GRADING

No.	Assessment	Number	% each	% total
1	Assignments (Individual)	2	5%	10
2	Quizzes	minimum 2	5%	10
3	Skill-based Test	3	5%	15
4	Lab Exercises	minimum 4	1.25%	5
5	*Project (Phase 1 - 4) (Group)	1	10%	10
6	Project Presentation (Individual)	1	5%	5
7	Mid Term Test	1	20%	15
8	Final Exam	1	30%	30
	Overall Total			100

* Phase 1: Proposal, Phase 2: Design, Phase 3: Initial result, Phase 4: Final result