1	Course Name:	Object-Oriented Programming				
	Course Code:	BACS2023				
	Course Classification:	Major (core)				
2	Synopsis:	This course presents the concepts of object-oriented programming such as encapsulation, inheritance, dynamic binding and polymorphism, with the use of a programming language for illustrating and implementing the concepts. In addition, this course also covers the impact of the object-oriented approach on software maintenance, extensibility, and reuse.				
3	Name(s) of Academic Staff:	1	Refer to timetable			
		2				
		3				
4	Semester and Year offered:	Year Offered		Semester		*Remarks: Refer to Programme Structure*
5	Credit Value:	3				
6	Pre-requisite/ co-requisite (if any):	BACS1013 Problem Solving and Programming (for Bachelor of Computer Science (Honours) in Software Engineering only) BACS1014 Problem Solving and Programming (for all other programmes)				

7

Course Learning Outcomes (CLO)		
	CLO1	Discuss the advantages of object-oriented programming over procedural programming especially with regards to software maintenance, extensibility and reuse. (C2, PLO1)
	CLO2	Demonstrate an object-oriented program using appropriate programming fundamentals with regards to arrays, methods and exception handling. (P4, PLO3)
	CLO3	Analyse the concepts of encapsulation, inheritance and polymorphism based on programming problems. (C4, PLO2)

8 Mapping of the Course Learning Outcomes to the Programme Learning Outcomes, Teaching Methods and Assessment Methods

Course Learning Outcomes	Programme Learning Outcomes (PLO)												Teaching Methods	Assessment Methods
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11			
CLO1	√												L, P, NF2F	Test/Quiz, Examination
CLO2			√										L, P, NF2F	Assignment
CLO3		√											L, P, NF2F	Assignment, Examination
Mapping with MQF Cluster of Learning Outcomes	C1	C3A	C2											

Indicate the primary causal link between the CLO and PLO by ticking '√' in the appropriate box.

C1 = Knowledge & Understanding, **C2** = Cognitive Skills, **C3A** = Practical Skills, **C3B** = Interpersonal Skills, **C3C** = Communication Skills, **C3D** = Digital Skills, **C3E** = Numeracy Skills, **C3F** = Leadership, Autonomy & Responsibility, **C4A** = Personal Skills, **C4B** = Entrepreneurial Skills, **C5** = Ethics & Professionalism

9 Transferable Skills (if applicable)

(Skills learned in the course of study which can be useful and utilized in other settings)

1	Cognitive skills
2	
3	

Open-ended response (if any)

4	

10 Distribution of Student Learning Time (SLT)

Note: This SLT calculation is designed for home grown programme only.

Course Content Outline and Subtopics		CLO*	Learning and Teaching Activities**									Total SLT
			Face-to-Face (F2F)								NF2F Independent Learning (Asynchronous)	
			Physical				Online/ Technology-mediated (Synchronous)					
			L	T	P	O	L	T	P	O		
1	Dynamic Variables and Exception Handling • Primitive and Reference types • Static vs dynamic storage allocation • Exception handling Practical: Introduction to Object Orientation Practical: Methods and Exception Handling	1,2	4		4						4	
2	Classes and Objects • Object identification, class definition, information hiding and encapsulation • Object declaration, construction and destruction • Objects as parameters • Arrays of objects • Access control for class members Practical: Objects and Classes Practical: Class for Processing Strings	2,3	10		12						7	
3	Inheritance • Single and multiple inheritance • Derived classes and parent classes • Method overriding • Class hierarchies and object-oriented design fundamentals Practical: Inheritance & Polymorphism Practical:Abstract Classes & Interfaces	3	6		6						7	
4	Polymorphism • Method overloading and resolution • Dynamic binding, virtual methods and abstract classes • Ad hoc and parametric polymorphism Practical:Abstract Classes & Interfaces Practical: OO Design & Patterns	3	6		6						7	
5	Comparison of Programming Paradigms • Comparison with the procedural programming approach • Impact of the object-oriented approach on software maintenance, extensibility and reuse	1	2		0						3	

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17											
18											
19											
20											
										SUB-TOTAL SLT:	**84**

	Continous Assessment	%	Face-to-Face (F2F)		NF2F Independent Learning for Assessment (Asynchronous)
			Physical	Online/ Technology-mediated (Synchronous)	
1	Test/Quiz	28	2		5
2	Assignment	42	3		18
3					
4					
5					
				SUB-TOTAL SLT:	**28**

	Final Assessment	%	Face-to-Face (F2F)		NF2F Independent Learning for Assessment (Asynchronous)
			Physical	Online/ Technology-mediated (Synchronous)	
1	Examination	30	2		6
2					
3					
4					
5					
				SUB-TOTAL SLT:	**8**

	SLT for Assessment:	36
	GRAND TOTAL SLT:	120
A	% SLT for F2F Physical Component: *[Total F2F Physical /(Total F2F Physical + Total F2F Online + Total Independent Learning) x 100)]*	52.50
B	% SLT for Online & Independent Learning Component: *[(Total F2F Online + Total Independent Learning) /(Total F2F Physical + Total F2F Online + Total Independent Learning) x 100]*	**47.50**
C	% SLT for All Practical Component: *[% F2F Physical Practical + % F2F Online Practical]*	**23.33**
C1	% SLT for F2F Physical Practical Component *[Total F2F Physical Practical /(Total F2F Physical + Total F2F Online + Total Independent Learning) x 100)]*	**23.33**
C2	*% SLT for F2F Online Practical Component* *[Total F2F Online Practical / (Total F2F Physical + Total F2F Online + Total Independent Learning) x 100]*	**0.00**

	Please tick (V) if this course is **Industrial Training/ Clinical Placement/ Practicum** using 50% of Effective Learning Time (ELT)	
	Note: * Indicate the CLO based on the CLO's numbering in Item 8 ** For ODL programme: Courses with mandatory practical requiremnets imposed by the programme standards or any related standards can be exempted from complying to the minimum 80% ODL delivery rule in the SLT.	
11	Identify special requirement or resources to deliver the course (e.g., software, nursery, computer lab, simulation room etc)	NIL
12	References (include required and further readings, and should be the most current)	**Main references supporting the course** 1. Liang, Y. D. (2022). *Introduction to Java programming and data structures: comprehensive version* (12th ed.). Pearson. 2. Farrell. (2022). *Java Programming* (10th ed.). Cengage Learning. https://tarcez.tarc.edu.my/login?url=https://resolver.vitalsource.com/9780357675533
13	Other additional information (if applicable)	NIL
	Note: Number of PLO indicated is purely for illustration purposes only and the number is subjected to the curriculum design.	