# Introduction to Modern C++ Course Outline

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## Week 1: Introduction to C++

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	1.2	Why Learn C++
<b>2</b>	Fea	tures of C++
	2.1	Evolution of $C++$
	2.2	The C++ Philosophy
	2.3	C++ vs. Other Languages
3	Env	ironment Setup 3
	3.1	Tools Required
		3.1.1 Text Editor
		3.1.2 Compiler
	3.2	"Hello, World!" Example
4	Bas	ic Syntax and Structure 4
	4.1	Basic Structure of a C++ Program
		4.1.1 int main()
		4.1.2 Statements and Expressions
	4.2	Foundational Concepts
		4.2.1 Semicolons, /* comments */, and Whitespace 5
		4.2.2 Line-by-Line Execution
	4.3	Input and Output with iostream
5	Dat	atypes and Variables 6
	5.1	sizeof Operator
	5.2	Primitive Types
	5.3	Declaration and Definition
		5.3.1 Assignment Operator =
		5.3.2 Brace Initialization {}
	5.4	Arithmetic Operators
	5.4	Arithmetic Operators

## Week 2: How C++ Works

1	$\mathbf{The}$	e Build Process
	1.1	Source Code
	1.2	Preprocessor
		1.2.1 Text Substitution
		1.2.2 Conditional Compilation
		1.2.3 File Inclusion
		1.2.4 Preprocessor Output
	1.3	Compilation
		1.3.1 Compiler Output
	1.4	Linking
<b>2</b>	Testes	aduction to Memory
4		roduction to Memory
	2.1	How C++ Uses Memory
	2.2	Pointers
		2.2.1 NULL Pointers
		2.2.2 Pointer Arithmetic
		2.2.3 Pointers to Pointers
3	Mer	mory Layout
-	3.1	Text Segment
	3.2	Static Memory
	3.3	The Heap
	ა.ა	The meap

## Week 3: C++ Control Flow

1	Fun	ctions	<b>2</b>
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	1.2	Function Overloading	3
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		2.1.2 Local Scope	3
		2.1.3 Anonymous Scope	3
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		2.2.1 Namespace Operator ::	4
		2.2.2 using Namespaces	4
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		3.1.1 bool() Casts	4
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		3.1.3 Logical Operators: !, &&,	4
	3.2	if Statements	4
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	3.3	switch Statements	5
	3.4	Ternary Operator ? :	5
4	Loo	ps	5
	4.1	while Loops	5
		4.1.1 do while Loops	5
	4.2	for Loops	5
		4.2.1 Blank Fields	5
5	Cor	trol Flow Keywords	5
	5.1	break Keyword	5
	5.2	continue Keyword	5
	5.3	return Keyword	5

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	2.1	Struct Initialization	2
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		3.1.1 Initializer Lists	2
		3.1.2 Default Initialization	2
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		3.2.1 private Members	2
		3.2.2 protected Members	2
		3.2.3 public Members	2
			2
	3.3		2

# Week 5: Advanced Object-Oriented Programming

1	Pri	nciples of Object-Oriented Programming
	1.1	Abstraction
		Encapsulation
	1.3	Inheritance
		1.3.1 virtual Functions
		1.3.2 Interfaces
	1.4	Polymorphism
	1.5	Composition // not usually included
<b>2</b>		erator Overloading
	2.1	Type Casting
	2.2	friend Functions

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		1.1.1 std::array	2
		1.1.2 std::vector	2
		1.1.3 std::deque	2
		1.1.4 std::list	2
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