8 INTERMEDIATE C++

Welcome to Intermediate C++ programming! This course will dive deeper into the core aspects of C++ programming and provide you with a solid foundation for further development. We're going to cover some of the building blocks of C++, including arrays, strings, pointers, classes and objects, exception handlers, and much more.

Firstly, we'll explore arrays, which allow you to store multiple values of the same type in a single block of memory. This can be particularly useful when programming a mobile robot to follow a specified path, for example:

```
int path[5] = {1, 2, 3, 4, 5};
```

Next, we'll dissect strings – sequences of characters used to store and manipulate text. For instance, we may use a string to denote the robot's status:

```
std::string status = \"Moving Forward\";
```

Pointers are on our list as well. They are essential and powerful features in C++, storing memory addresses of other variables, which can be useful for dynamic memory allocation in robot's tasks:

```
int batteryLevel = 100;
int* p = &batteryLevel;
```

We will also delve into classes and objects – the backbone of Object-Oriented Programming (OOP). Classes act as blueprints for objects, while objects represent instances of a class. For mobile robot programming, we could have a class "Robot" and create objects representing specific robots:

```
class Robot {
 std::string name;
 int speed;
 // Other attributes and methods...
};

Robot MobileRobot;
MobileRobot.speed = 255; //full speed
```

Lastly, we'll look into exception handlers, they are mechanisms that handle runtime errors, ensuring our robot doesn't crash when it encounters an issue:

```
try {
 // Code that could throw an exception
} catch (const std::exception& e) {
 // Handle exception
}
```

By the end of this course, you'll have a solid understanding of these key C++ programming concepts and be able to apply them to real-world mobile robot programming scenarios. So, let's get started!