

## Qt Tutorials Course Outline

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### Qt Core

- **Primer**
  - Overview of C++
    - History
    - Modern C++
    - Qt and C++
    - Main function
    - Standard library
    - Hello world
  - Variables
    - Comments
    - Booleans
    - Numbers
    - Enums
    - Structs
  - Pointers
    - Creating
    - Deleting
    - Stack vs Heap
    - Memory management
  - Flow Control
    - IF ELSE
    - Ternary
    - Switch
    - Do While
    - For and For Each
  - Functions
    - Creating
    - Returning values
    - Overloading
    - By ref
    - By value
  - Classes
    - Creating
    - Constructors
    - Destructors
    - Inheriting
    - Overriding
    - Abstract
  - Scope
    - Main

- Functions
  - Classes
  - Global
- Error handling
  - Errors vs exceptions
  - Throwing
  - Try catch
  - Finally
  - Catch All
- **Beginner**
  - Qt and Qt Creator
    - Overview
    - Licensing
    - Downloading
    - Installing
    - Configuration
    - Kits
  - Project Types
    - Console
    - Widget
    - QML
    - Library
    - Example: Hello World
  - Common Classes
    - QObject
    - QString
    - QDate
    - QTime
    - QDateTime
    - QVariant
    - Example: using a QVariant to store unknown data types
  - Pointers
    - Parent and Child
    - QWeakPointer
    - QScopedPointer
    - QSharedPointer
    - Example: Using QScopedPointer
  - Collections
    - QList
    - QSet
    - QHash
    - QMap
    - QLinkedList
    - Example: Lists of objects
  - Signals and Slots

- Creating
  - Connecting
  - Disconnecting
  - Example: Working with properties
- File System
  - QDir
  - QFile
  - QFileInfo
  - Reading Files
  - Writing files
  - Appending files
  - Write modes
  - Example: Reading files
- Encoding data
  - ASCII
  - UTF-8
  - XML
  - JSON
  - Base64
  - Serializing objects
  - Example: Serialize object and load it from disk
- **Intermediate**
  - Design Patterns
    - Header files
    - Includes
    - Global variables
    - Singleton patterns
    - Parent child
    - Factories
    - Prototypes
  - Macros
    - QObject Macro
    - qDeleteAll
    - qDebug
    - qFill
    - qSort
    - qCopy
    - qFind
    - qSort
  - Make files
    - Install Path
    - Source Paths
    - Imports
    - PRI files
    - PWD

- System
  - QSysInfo
  - Determine OS at run time
  - Example: Run code depending on the OS
- Timer
  - QTimer
  - SingleShot
  - Repeating
  - Example: File watcher
- **Advanced**
  - Plugins
  - Threads
    - MoveToThread
    - QThread
    - QThreadPool & QRunnable
    - QConcurrence
    - Example: Threaded TCP Server
  - Sockets
    - Networking fundamentals
    - TCP vs UDP
    - TCP Socket
    - TCP Server Socket
    - QnetworkAccessManager
    - UDP
    - Example: TCP – serialize object and send it to client
  - Database
    - Database fundamentals
  - Encryption
    - Encryption fundamentals
    - Importing the lib
    - Asymmetric
    - Symmetric
    - Open SSL
  - Charts and Plotting
  - Firebase
    - Firebase fundamentals
    - Creating an account
    - File storage
    - Real time database
    - Messaging
  - 3D
  - Boost.io
  - OpenCV

## Qt Widgets

- Beginner
- Intermediate
- Advanced

## QML

- Beginner
- Intermediate
- Advanced

## Qt Embedded

- Beginner
- Intermediate
- Advanced