

Qt Tutorials Course Outline

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Qt Core

- **Beginner**
 - Qt and Qt Creator
 - Overview
 - Licensing
 - Downloading
 - Installing
 - Configuration
 - Kits
 - Help
 - IDE Walk-through
 - Projects types
 - Console Application Hello world
 - Project files
 - Overview of C++
 - History
 - Legacy C++
 - Modern C++
 - Main function
 - Standard library
 - How Qt fits in
 - Example: Hello World with qDebug
 - Comments
 - One line
 - Multi line
 - Special
 - Variables
 - Booleans
 - Numbers
 - const
 - Enums
 - Structs
 - Input and output types
 - STDIN
 - STDOUT
 - STDERR
 - QDebug
 - Flow Control
 - IF (long and short version)
 - IF ELSE
 - Ternary

- Switch
- Do While
- For and For Each
- Functions
 - Creating
 - Returning values
 - Overloading
 - By ref By value
 - Functions in STRUCT
- Classes
 - Creating / Importing
 - Constructors / Deconstructors
 - Inheriting
 - Abstract and Interfaces
 - Overriding
 - ~~▪ Operator Overloading~~
- Scope
 - Functions
 - Classes
 - Global
- Pointers
 - Stack vs Heap – pointer vs non-pointer
 - creating / deleting
 - Copy Constructors vs pointers – why use pointers at all? FAST!!!
 - Memory management
- Signals and Slots
 - Creating and Connecting
 - Disconnecting
 - Properties
- Casting – example from a signal
 - Normal
 - Static cast
 - Dynamic cast
 - QObject Cast
- Error handling
 - Errors vs exceptions
 - Throwing
 - Try catch
 - qDebug to file
- Generics
 - Generics
 - Generic Functions
 - Generic Classes
- Common Classes

- Qobject
 - Qint
 - QString
 - Qdate Qtime QDateTime
 - QByteArray
 - QVariant
 - Example: using a QVariant to store unknown data types
- **Intermediate**
 - Pointers
 - Parent and Child
 - QWeakPointer
 - QScopedPointer
 - QSharedPointer
 - Example: Using QScopedPointer
 - Collections
 - QList
 - QSet
 - QHash
 - QMap
 - QLinkedList
 - Example: Lists of objects
 - File System
 - QDir
 - QFile
 - QFileInfo
 - Reading Files
 - Writing files
 - Appending files
 - Write modes
 - QFileSystemWatcher
 - QLockfile
 - Example: Reading files
 - Logging
 - qInstallMessageHandler
 - QMessageLogger
 - Encoding data
 - ASCII
 - UTF-8
 - XML
 - JSON
 - Base64
 - Serialization
 - Simple Objects
 - Complex Objects
 - Lists

- Maps
 - Macros
 - QObject Macro
 - qDeleteAll
 - qFill
 - qSort
 - qCopy
 - qFind
 - qSort
 - System
 - QSysInfo
 - QSettings
 - QProcess
 - Determine OS at run time
 - Example: Run code depending on the OS
 - Timer
 - QTimer
 - SingleShot
 - Repeating
 - Example: File watcher
 - Meta Object System
 - QMetaObject
 - Q_ClassInfo
 - Invoke Method
 - Return Type
 - Design Patterns
 - Singleton patterns
 - Factories
 - Prototypes
- **Advanced**
 - Sockets
 - Networking fundamentals
 - TCP vs UDP
 - TCP Socket
 - TCP Server Socket
 - QNetworkAccessManager
 - UDP
 - Example: TCP – serialize object and send it to client
 - Threads
 - MoveToThread
 - Qthread
 - QFuture
 - QThreadPool & QRunnable
 - QConcurrence

- Example: TCP Server
- Models
 - Model view programming
 - QStringList
 - QStandardItem
 - QfileSystemModel
 - QAbstractItemModel
 - QAbstractList
 - QAbstractTableModel
- Database
 - Databases
 - Setup MySQL
 - Connection
 - Add Items
 - Update Items
 - Delete Items
 - Search items
 - QSqlQueryModel
 - QSqlTableModel
 - QSqlRelationalTableModel
- Plugins
 - Creating
 - Loading
 - Using
 - Example: TCP Server with Plugins
- Using Libraries
 - Boost
 - Compression
 - Encryption
 - C++ to Qt conversions

Qt Widgets

- Beginner
 - UI Fundamentals
 - QDialog
 - UI Files
 - QSlider and QProgressbar manual connect
 - QSlider and QProgressbar using the GUI
 - QLabel
 - QPushButton – right click and create slot
 - QMessageBox
 - Example – display a save file dialog when closing the QDialog
 - User Input

- QCheckBox
 - QRadioButton
 - QSpinBox
 - QDoubleSpinBox
 - QComboBox
 - QDial
 - QSlider
- o Date and Time
 - QDateEdit
 - QTimeEdit
 - QDateTimeEdit
 - QCalendarWidget
 - Example – flight booking
- o Text Editing
 - QLineEdit
 - QTextEdit
 - QTextBrowser
 - Example – rich note pad
- o Layouts
 - Horizontal
 - Vertical
 - Splitters
 - Layouts in layouts
 - Padding and properties
- o Organizers
 - QScrollArea
 - QButtonGroup
 - QGroupBox
 - QSplitter
 - QSplitterHandle
 - QStackedWidget
 - QTabWidget
- Intermediate
 - o Opening Dialogs
 - Open one
 - Open multiple
 - Open modal
 - Sharing data between windows
 - o Main Windows
 - Central Widget
 - Resources
 - QAction
 - QActionGroup
 - QMenu
 - QToolbar

- QStatusBar
- o MDI Windows
 - MDI Area
 - New Children
 - Arranging
 - Accessing
 - Closing
- o Styling
 - QColor
 - QFont
 - QStyle
 - QCommonStyle
 - QStyleFactory
 - Example – creating a custom style
- o Lists, Trees and Tables
 - QListWidget
 - QTreeWidget
 - QTableWidget
- o Models and views
 - QStringListModel
 - QStandardItemModel
 - QFileSystemModel
 - QListView
 - QTreeView
 - QTableView
- o
- Advanced
 - o Custom Widgets
 - o 3d
 - o Charts
 - o Graphs
 - o Graphics
 - o Video

QML

- Beginner
- Intermediate
- Advanced

Qt Embedded

- Beginner
- Intermediate
- Advanced

Qt Masters – each one is a separate class

- 3D – Use Qt 3d Studio and Blender
- Firebase
- Boost.io
- OpenCV
- Encryption – OpenSSL or Botan
- High performance TCP Server
- Database