

# Using VAPS XT Course Syllabus

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Session duration: Classroom 4 days

## Main Objective

In this course, you will learn how to build basic applications using VAPS XT and how to create and add new objects with the tool. The course also covers the use of VAPS XT State Charts for logic and explores the available communication mechanisms.

Upon completion of the course, the participant should be able to create formats and objects and be able to generate executables from these formats. You will understand how to use the major predefined objects in VAPS XT and will be able to create your own.

## Target Audience

This is an ideal course for individuals that want to learn how to use VAPS XT to design graphic applications.

## Prerequisites

This course assumes basic PC knowledge.

## Format

This Instructor-led course is taught through a series of lectures and hands-on exercises in which you learn how to use all of the components of the tool.

## Topics Covered

- VAPS XT overview
- Basic format creation
- Using and modifying objects
- Advanced objects
- State charts
- Creating objects graphically
- Creating objects through code
- Interfacing with hardware and data
- Communications
- CODE nGEN

# Daily Outline for Classroom “Using VAPS XT” Course

## Day 1

- Lesson 1: VAPS XT overview
- Lesson 2: Basic format creation
- Lesson 3: Using and modifying objects

## Day 2

- Lesson 4: Advanced objects
- Lesson 5: State charts
- Lesson 6: Creating objects graphically

## Day 3

- Lesson 7: Creating objects through code
- Lesson 8: Interfacing with hardware and data

## Day 4

- Lesson 9: Communications
- Lesson 10: CODE nGEN
- Recap of the 10 lessons
- Questions and Answers specific from trainees
- Closing the course

# Detailed Description

## Lesson 1: VAPS XT overview

- High-level product presentation
- Standard workflow
- Developing the display formats
- Object-oriented architecture
- Integrated state charts

## Lesson 2: Basic format creation

- Instantiating pre-built objects
- Data flow connections
- Runtime mode basics
- Installation
- Demo project for course
- EXERCISE 2-1: Creating a basic application
- File location
- Documentation and tutorials
- Keyboard shortcuts

## Lesson 3: Using and modifying objects

- Root Project
- Working with the Toolbox
- Categories and types of objects
- Drawing context
- EXERCISE 3-1: Continuous objects
- Attributes of the VAPS XT objects
- EXERCISE 3-2: Discrete objects
- Color tables
- Modifying data in a data flow
- Inserting comments
- EXERCISE 3-3: Creating data flows and inserting comments
- Changing the color of an object
- Organizing objects using groups
- Watching properties at runtime
- EXERCISE 3-4: Greenhouse controls
- Record & Playback
- EXERCISE 3-5: Record & Playback

#### **Lesson 4: Advanced objects**

- EXERCISE 4-1: Calculators as objects and functions
- EXERCISE 4-2: Calculators with multiple inputs
- Built calculators
- EXERCISE 4-3: Creating a built calculator
- Hierarchical objects
- Embedded active areas
- Special purpose calculators
- EXERCISE 4-4: Embedded objects
- EXERCISE 4-5: Solar system
- Understanding groups
- Font types
- EXERCISE 4-6: Creating and using a vector font
- EXERCISE 4-7: Adding and using a True Type font
- EXERCISE 4-8: Creating and using a raster font
- Audio and video objects
- EXERCISE 4-9: Audio and video objects
- EXERCISE 4-10: UI components
- Localized text
- EXERCISE 4-11: Localization of greenhouse

#### **Lesson 5: State charts**

- Toolbar
- Triggers, guards and actions
- EXERCISE 5-1: Creating a basic state chart
- Hierarchical states
- EXERCISE 5-2: Logic system with hierarchical states
- Associating graphics to states
- EXERCISE 5-3: Attaching graphics to states
- EXERCISE 5-4: “when” trigger
- Calling object operations
- EXERCISE 5-5: Object operations
- History connector
- EXERCISE 5-6: History connector
- EXERCISE 5-7: Managing data entry

## **Lesson 6: Creating objects graphically**

- Object implementation types
- Built objects
- Graphical objects
- Objects and formats
- EXERCISE 6-1: Creating a graphical object
- EXERCISE 6-2: Part 1: Modifying an Object
- EXERCISE 6-2: Part 2: Adding internal logic
- EXERCISE 6-2: Part 3: Events and Operations
- Adding new elements to the Toolbox
- Associating an icon with an object
- Container objects
- EXERCISE 6-3: Creating a container object
- Clipboard objects
- EXERCISE 6-4: Creating a clipboard object
- Creating variants of VAPS XT objects
- EXERCISE 6-5: Creating a button object variant
- EXERCISE 6-6: Creating a virtual keypad
- Adding audio, video, and images to a display
- Difference between global tables and local tables
- EXERCISE 6-7: Working with graphics
- EXERCISE 6-8: Adding elements to a panel

## **Lesson 7: Creating objects through code**

- Coded implementations
- Using template generators
- Different compilation options
- Graphic libraries
- Class Editor options
- EXERCISE 7-1: Creating a coded graphical object
- EXERCISE 7-2: Creating a coded calculator

## **Lesson 8: Interfacing with hardware and data**

- Discrete event receiver
- DiscreteEvt structure
- EXERCISE 8-1: Using a Discrete event receiver
- Using coded calculators as an external interface
- EXERCISE 8-2: Using a coded calculator as an external interface

## **Lesson 9: Communications**

- Data sender and data receiver objects
- nCOM
- Mappings
- Configuring connections
- Data description (\*.dd) files
- Sender and receiver objects
- EXERCISE 9-1: VAPS XT to VAPS XT using nCOM
- EXERCISE 9-2: VAPS XT to external application (C++) using nCOM

## **Lesson 10: CODE nGEN**

- Runtime platforms and porting
- Required Visual Studio libraries
- Code generation options
- EXERCISE 10-1: Generating an executable using CODE nGEN
- EXERCISE 10-2: Generating an executable that uses nCOM

## **Appendix A: Software requirements**