

ARDUINO & RADIO COURSE

This course is in two parts. The first starts right at the beginning and introduces the Arduino and its code development platform, the IDE (Integrated Development Environment). It teaches basic coding of "Sketches" (programs) and coding functions and techniques.

The course is based on a low cost kit of parts by Miuzei, available for £23 on Amazon.



PART ONE - expect 8 to 10 sessions

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|---------------------------|---|
| 1. The IDE | Set up your PC, install IDE, configure |
| 2. BLINK | First ever sketch, basic layout |
| 3. LED TRAIL | Learn "#define" and "for" loops |
| 4. TRAFFIC LIGHTS | "delay()" function |
| 5. ANALOG INPUT | A/D convertors, "analogRead()" and "map()" |
| 6. BUTTON | "digitalread()" and input pullup |
| 7. FADING | PWM analog output |
| 8. BUZZER | "if...else" decisions |
| 9. PASSIVE BUZZER | "tone()" function |
| 10. RGB LED | Tri-colour LED, make any colour |
| 11. MAKE SOUNDS | Use a photocell as an input, "tone()" output |
| 12. TILT SWITCH | Detect movement |
| 13. SHIFT REGISTER | Expand outputs with Shift Register IC (74HC595) |
| 14. 7 SEGMENT DISPLAY | Use of arrays |
| 15. 4 x 7 SEGMENT DISPLAY | Multiplexing, own functions |
| 16. SWEEP | Using a small servo motor |
| 17. KNOB, ENCODER | Reading an analog sensor and digital encoder |
| 18. STEPPER | Using a small stepper motor |
| 19. STEPPER ADVANCED | Libraries for better control |
| 20. RANGE | Ultra Sonic range finder |
| 21. REMOTE | Remote key pad input |
| 22. TEMP & HUMID | Basic weather station |
| 23. THE I2C BUS & LCD | How to use the LCD display and I2C bus |
| 24. TEMP & HUMID LCD | Display Temp & Humid on LCD |
| 25. WATER LEVEL | Measure the water level in a cup |

PART TWO - APPLICATIONS

Part two of the course enters the world of home brew Amateur Radio, and the use of digital circuits and programming. It will require some parts purchases

COMPONENTS

Si5351 module

AD9851 module

AD9833 module

OLED display

ROTARY ENCODE module

REAL TIME CLOCK module

ELEKTOR SDR board

GPS receiver

Plus, if you wish, the parts to make the SSB Exciter.

Applications

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|-----------------------------|---|
| 26. RTC DS3231 | Real Time Clock, LCD display |
| 27. Si5351, AD9851 & AD9833 | Synthesisers, BB build |
| 28. Si5351 Freq Calibration | Calibration of your Si5351, WSJT-X software |
| 29. WSPR | Whisper transmitter |
| 30. VFO | 1-150MHz, 3 output VFO, calibration |
| 31. AUDIO SIGGEN | 0-100kHz audio signal generator |
| 32. BEACONS | CW, RTTY, PSK31 |
| 33. HELLSCHIEBER | Hellschreiber transmitter, 7x14 & MT 5x7 |
| 34. GPS | Lat/Lon, MH locator |
| 35. SDR | Elektor (G4XTA project) |
| 36. VSWR | 100mW - 10W SWR meter |
| 37. SSB | SSB exciter, simple for 40m |

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