# Signatures

You will be experimenting with various aspects of WICED Bluetooth by completing the exercises below. Labs are marked as "Basic" and "Advanced". You should make sure you complete the basic exercises first and then work on the advanced exercises as time allows.

| **✓** | **Chapter** | **Exercise** | **Category** | **Description** |
| --- | --- | --- | --- | --- |
|  | 01 (Tour) | 1.1 | Basic | Create a forum account |
|  |  | 1.2 | Basic | Open the WICED documentation |
|  |  | 1.3 | Basic | Download the Bluetooth Spec Version 5.0 |
|  | 02 (Peripherals) | 2.1 | Basic | Install kit + shield platform files |
|  |  | 2.2 | Basic | Blink an LED |
|  |  | 2.3 | Basic | Add Debug Printing to the LED Blink Project |
|  |  | 2.4 | Basic | Read the State of a Mechanical Button |
|  |  | 2.5 | Basic | Use an Interrupt to Toggle the State of an LED |
|  |  | 2.6 | Basic | Write and Read Data in the NVRAM |
|  |  | 2.7 | Basic | Toggle 4 I2C Controlled LEDs |
|  |  | 2.8 | Basic | Read PSoC CapSense Button Values using I2C |
|  |  | 2.9 | Advanced | Read PSoC Sensor Values using I2C |
|  |  | 2.10 | Advanced | LED brightness |
|  |  | 2.11 | Advanced | LED toggling at specific frequency and duty cycle |
|  |  | 2.12 | Advanced | Measure Ambient Light Sensor |
|  |  | 2.13 | Advanced | Send a value using the standard UART functions |
|  |  | 2.14 | Advanced | Get a value using the standard UART functions |
|  |  | 2.15 | Advanced | Display Data on the OLED Display |
|  |  | 2.16 | Advanced | Display Time and Date Data on the OLED Display |
|  | 03 (RTOS) | 3.1 | Basic | Semaphore |
|  |  | 3.2 | Advanced | MUTEX |
|  |  | 3.3 | Advanced | Queues |
|  |  | 3.4 | Advanced | Timers |
|  | 04A (Essential BLE Peripherals) | 4A.1 | Basic | Create a BLE Project with a WicedLED Service |
|  |  | 4A.2 | Basic | Add a Connection Status LED |
|  |  | 4A.3 | Basic | Create a BLE Advertiser |
|  |  | 4A.4 | Basic | Connect using BLE |
|  | 04B (More Advanced BLE Peripherals) | 4B.1 | Basic | Simple BLE Project with Notifications |
|  |  | 4B.2 | Basic | BLE Notifications for CapSense |
|  |  | 4B.3 | Basic | BLE Pairing and Security |
|  |  | 4B.4 | Advanced | Save BLE Pairing Information (i.e. Bonding) |
|  |  | 4B.5 | Advanced | Add a Pairing Passkey |
|  |  | 4B.6 | Advanced | Add Numeric Comparison |
|  |  | 4B.7 | Advanced | Add Multiple Device Bonding Capability |
|  | 04C (Even More Advanced BLE) | 4C.1 | Basic | Advertise Manufacturing Data and Provide Scan Response |
|  |  | 4C.2 | Basic | Implement Eddystone URL Beacon |
|  |  | 4C.3 | Basic | BLE Low Power (PDS) |
|  |  | 4C.4 | Advanced | Use Multi-Advertising on a Beacon |
|  |  | 4C.5 | Advanced | OTA Firmware Upgrade (Non-Secure) |
|  |  | 4C.6 | Advanced | OTA Firmware Upgrade (Secure) |
|  |  | 4C.7 | Advanced | BLE Low Power (SDS) |
|  | 04D (BLE Centrals) | 4D.1 | Basic | Make an Observer |
|  |  | 4D.2 | Basic | Add a Filter to Show Only Your Device |
|  |  | 4D.3 | Basic | Connect to Your Peripheral and Turn ON/OFF the LED |
|  |  | 4D.4 | Advanced | Add Commands to Turn Notify ON/OFF |
|  |  | 4D.5 | Advanced | Do Service Discovery |
|  |  | 4D.6 | Advanced | Run the Advertising Scanner |
|  | 05 (Debugging) | 5.1 | Basic | Use ClientControl |
|  |  | 5.2 | Basic | Run BTSpy |
|  |  | 5.3 | Advanced | Run the Debugger |
|  | 06A (Classic Bluetooth – SPP) | 6A.1 | Basic | Create a Serial Port Profile Project |
|  |  | 6A.2 | Basic | Add UART Transmit Capability |
|  |  | 6A.3 | Advanced | Improve Security by Adding IO Capabilities (Display) |
|  |  | 6A.4 | Advanced | Improve Security by Adding IO Capabilities (Yes/No) |
|  |  | 6A.5 | Advanced | Add Multiple Device Bonding Capability |