KERNEL MASTERS
Embedded AI Training Institute

Embedded Linux Device Driver Development
From Basics to Advanced

A Comprehensive Roadmap from Essentials to Industry-Ready Expertise

Register Now:
www.kernelmasters.com

Presented By:
Founder & Director of Kernel Masters

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> Our Mission & Vision: To empower young Electronics Engineers with the right skills and training to build successful careers in Embedded Systems, while becoming a trusted bridge between talented engineers and the semiconductor industry by delivering quality, industry-ready professionals.

Kishore Kumar Boddu

Founder & Director of Kernel Masters

Embedded Linux Device Driver Course Roadmap

Level 1 – Essential Modules (8 Weeks)

Modules 1	Linux Basics & Shell Scripting	— 2 Weeks	Click here for detailed syllabus
Modules 2	Linux System Programming	— 3 Weeks	Click here for detailed syllabus
Modules 3	Linux Device Drivers	— 3 Weeks	Click here for detailed syllabus

Level 2 – Embedded Linux Project Modules (8 Weeks)

Modules 1	Embedded Linux with Beagle Bone Black	— 2 Weeks	Click here for detailed syllabus
Modules 2	Yocto Project with Beagle Bone Black	— 1 Week	Click here for detailed syllabus
Modules 3	Linux Debugging Techniques & GNU Tool chain	— 1 Week	Click here for detailed syllabus
Modules 4	Linux I2C Drivers	— 1 Week	Click here for detailed syllabus
Modules 5	Embedded Linux Projects	— 2 Weeks	Click here for detailed syllabus
Modules 6	Placement Assistance Program	— Till Placement	Click here for detailed syllabus

Level 3 - Add-On Modules (8 Weeks)

Modules 1	Linux Network & SPI Drivers	— 2 Weeks	Click here for detailed syllabus
Modules 2	Embedded Android	— 2 Weeks	Click here for detailed syllabus
Modules 3	Wi-Fi Driver / Firmware	— 2 Weeks	Click here for detailed syllabus
Modules 4	Industrial IoT Gateway	— 2 Weeks	Click here for detailed syllabus

Embedded Linux Device Driver Course Overview

Level 1 – Essentials

This level is for beginners who want to start a career in Embedded Linux Device Drivers. You will learn Linux basics, shell scripting, system programming, and driver concepts with hands-on examples.

Eligibility: Basic knowledge of C Programming and Data Structures

01

Level 2 – Embedded Linux Projects

This level focuses on hands-on practice in Embedded Linux device driver development. It helps learners improve their coding, implementation, and real-time project skills.

Eligibility: Successful completion of Level 1

02

Level 3 – Add-on

This level helps you specialize in a specific area of Embedded Linux. It builds deeper skills with practical, industry-focused learning.

Eligibility: Successful completion of Level 2

03

Level 1 [Essentials]

This is essential level for those who want to move to **Embedded Linux Device Driver development** area.

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What You Will Learn in Level 1

- Strong foundation in Embedded Linux Device Driver Development
- Linux basics and shell programming fundamentals
- System programming and device driver concepts
- Simple learning with practical real-time examples
- Preparation for Level 2: driver development and customization

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Linux System Programming (LSP)

Build strong fundamentals in Linux System Programming with hands-on experience in real-world applications.

Core Skill Set

- File, Process, and Memory Management
- Inter-Process Communication (IPC)
- Synchronization Mechanisms
- Socket Programming
- Multithreading

Practical Industry Examples

- Device Driver Test Cases
- Working with
  - evtest
  - fbtest
  - rtc test
  - i2cdev
  - spidev

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Linux Device Drivers (LDD)

Master Linux Device Driver development with real-world kernel subsystems and hands-on implementation.

Core Skill Set

- Linux Kernel Module Programming
- Interrupt Handling in Linux
- Kernel Threads and Kernel Timers
- Character, Block, and Network Device Drivers
- Multiple Device Driver Development

Practical Industry Examples

- Understanding existing Linux kernel subsystems
- Working with Input
  ALSA
  V4L2
  Network
  Camera
  IoT & Display subsystems

Level 2
[Embedded Linux Projects]

Gain 10x times real-time hands-on experience on **Embedded Linux Device Driver Development.**

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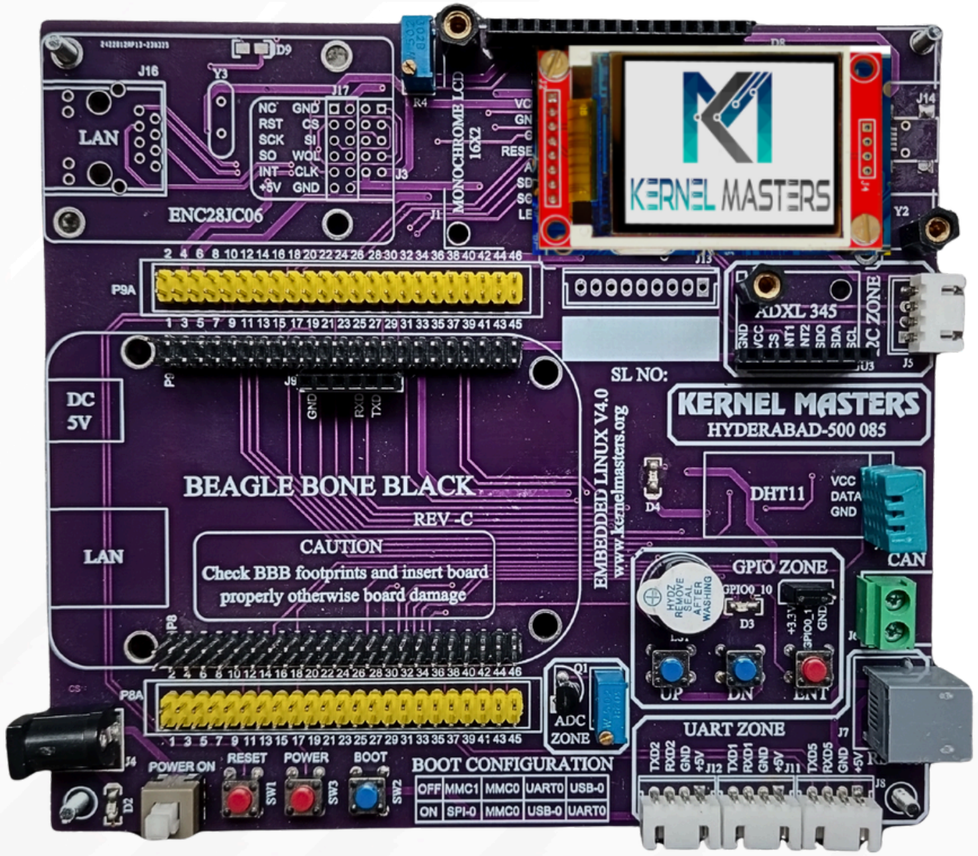
Beagle Bone Black [KM-BBB] Expansion Board



- Embedded Linux Development Board
- Board Specifications
- Serial Comm Protocols: UART, I2C, RS485, CAN, SPI & USB
- ADC Controller
- 16X2 Monochrome LCD display
- Wireless Protocols: Zigbee, BLE, WiFi
- RTC, EEPROM
- 128 GPIO Pins
- Buzzer
- LED’s
- Potentiometer

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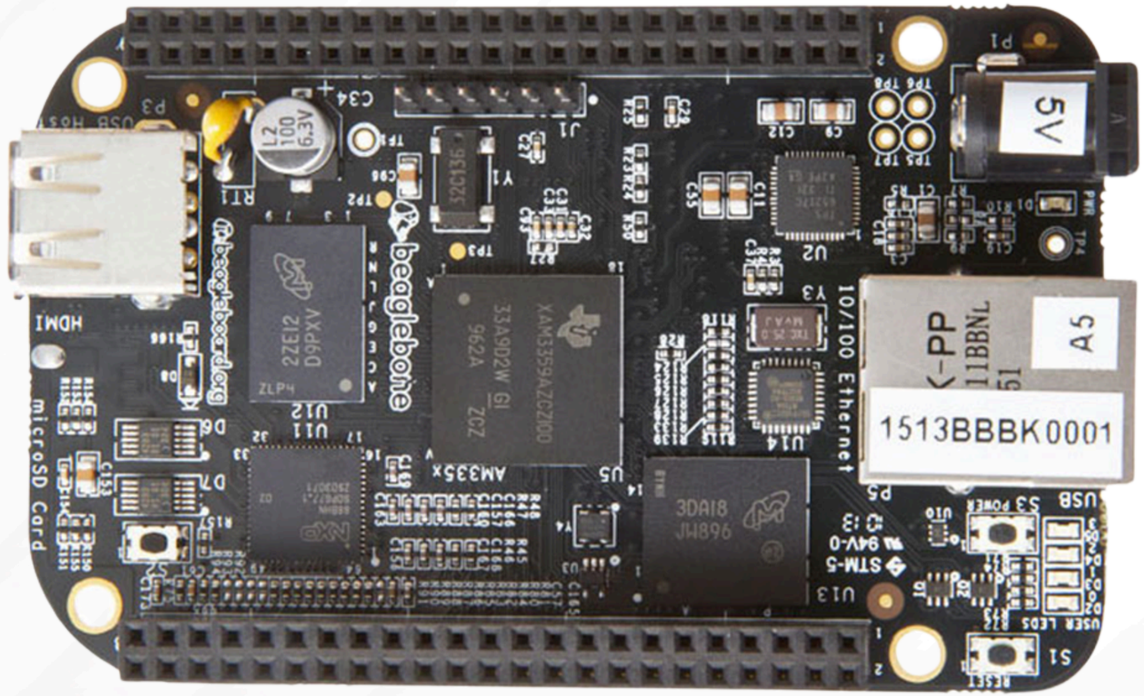
Beagle Bone Black



- Sitara AM3358BZCZ100 ARM Cortex-A8 32-Bit RISC microprocessor, up to 1GHz
- More and faster memory now with 512MB DDR3L 400MHz SDRAM, 4GB eMMC Memory
- Onboard storage frees up the microSD card slot for greater expansion
- Support for existing Cape plug-in boards
- TPS65217C PMIC regulator and one additional LDO
- Debug support: Optional onboard 20-pin CTI JTAG
- HS USB 2.0 Client and Host ports

What You Will Learn in Level 2

- Hands-on project experience in Embedded Linux Device Driver Development
- Device integration, porting, and boot process understanding
- Bootloader customization and boot-time optimization
- System-level learning with practical kernel exposure
- Strong industry-relevant real-time development experience

Embedded Linux Porting & BSP

Build, customize, and optimize Linux for real hardware platforms

Core Skill Set

- Linux Porting on target board
- Embedded Linux Boot sequence
- Boot loader
- ROM Code
- Device tree source
- Linux platform/Bus/low Drivers

Practical Industry Examples

- Embedded Linux Build systems:
- Create own build system
- Build Root
- Yocto Project.

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Yocto project on Beagle bone Black

Build custom Embedded Linux images using Yocto on Beagle Bone Black

Core Skill Set

- Yocto project build environment
- Customize yocto project as per board requirements.

Practical Industry Examples

- Embedded Linux Build systems
- Yocto Project porting on Beagle Bone Black Hardware

Linux I2C Drivers

Develop and interface I2C drivers for real embedded devices

Core Skill Set

- I2C Communication Protocol format
- I2C Framework in U-boot & kernel Space
- I2C User space drivers
- Linux I2C Adapter and Client Drivers

Practical Industry Examples

- Add I2C Slave Devices in Kernel Space.
- RTC [DS1307]
- EEPROM [AT24C02]
- Accelerometer Sensor [ADXL345]

Debugging Techniques

Identify, analyze, and fix issues in Embedded Linux systems

Core Skill Set

- GDB
- KGDB
- KDB
- strace
- valgrind
- Kprobe
- jprobe
- kexec
- crash tools

Practical Industry Examples

- Kernel panic
- Kernel crash dump
- Device driver
- Kernel debugging
- Application
- System program debugging

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Embedded Linux Real Time Projects

Build real-world Embedded Linux projects with hands-on implementation

Core Skill Set

- Add a new GPIO/UART/I2C/SPI devices
- UART, I2C
- SPI protocol formats
- Linux I2C
- SPI framework

Practical Industry Examples

- Add a project in your profile.
- Example: Data Lagger, Weather
- monitoring system
- IoT Gateway
- Handson Terminal
- Point of Sale
- Wi-FI Router
- Setup etc...

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About Us

Kernel Masters, established in November 2012, has **completed 14 years** of dedicated service in embedded systems training. We have **trained 10,000+** freshers and working professionals across **245 batches** and supported **15,000+ learners** in building careers in the embedded industry.

Our programs are designed for both **freshers** and experienced **professionals**, with nearly 30% of our learners coming from **Embedded Systems** or related domains to **upskill and advance their careers.** Our students are now working in reputed companies such as **Qualcomm, Sasken, Collabera, GlobalEdge, Mirafra, SmartPlay, American Megatrends, Visiontek, Qolsys, and Elear Solutions,** reflecting the strong industry relevance of our training in Device Drivers and Embedded Linux.

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Recognition of Excellence

Kernel Masters is proud to have been recognized as **"Embedded Training Institute of the Year"** for both **2022–2023 and 2023–2024** under the Global Education Award category. Receiving this recognition in consecutive years reflects **our consistent commitment to excellence** in embedded training, **practical learning,** and **industry-oriented skill** development.

These awards stand as a testament to our dedication in **shaping skilled embedded professionals** and delivering **quality technical education** that aligns with industry needs. Such achievements inspire us to continue **empowering students** and **professionals** with strong fundamentals, **hands-on experience,** and **career-focused training.**

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Thank You

For your attention

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