

## NIELIT Virtual Academy

### COURSE PROSPECTUS

**Name of the Course:** *Introduction to Device Driver Development*

**Course Code:** SP17

**Mode of Conduction:** *Online[Self-Paced]*

**Duration:** 20 Hours

### Objective of the Course

This skill oriented course provides participants with the information and knowledge experience necessary to evolve as a professional. This course covers basics of Device Driver Development. It provides practical approach as well as in-depth knowledge on related Device Driver Development and Embedded Protocols.

### Outcome of the Course:

Provide the participants with in-depth knowledge and skills required for Device Driver Development as per Industry Standards.

**Course Fee: Rs: 600/-(inclusive of GST)**

**Eligibility:** Pursuing or Graduate in BE/B.Tech/B.sc/BCA/MCA (IT/CS/Electronics)

### Methodology:

- ✓ Teaching Mode: Self-Pace
- ✓ Access from anywhere anytime
- ✓ Content Access through e-learning portal
- ✓ Doubt Removal Session
- ✓ Covers both Theory & Practical

**Registration Link:** <https://nva.nielit.gov.in>

### Contact Details:

- Course Coordinator Name : Mr. Prasanth B R, Project Engineer - IoT
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## Contents:

### Module 1: Introduction & Setting up Host and Target Environment for Device Driver Development

- ☐ Understand the basics of Linux device driver development and its role in embedded systems.
- ☐ Set up the Host and Target environments required for driver development and testing.
- ☐ Learn essential tools, cross-compilation, kernel source setup, and debugging workflow.

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### Module 2: Fundamentals of Linux Kernel Module (LKM) & Device Driver

- ☐ Learn the architecture and fundamentals of the Linux Kernel Module (LKM).
- ☐ Understand module loading, unloading, initialization, cleanup, and kernel APIs.
- ☐ Explore the structure, development, and working principles of Linux device drivers

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### Module 3: Pseudo Character Driver (PCD) using Kernel API's & PCD Operation

- ☐ Develop a Pseudo Character Driver using Linux Kernel APIs and standard driver interfaces.
- ☐ Understand file operations such as open, read, write, close, and device interaction.
- ☐ Implement and test PCD operations while gaining hands-on kernel programming experience.

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### Module 4: USB Device Drivers & Operation

- ☐ Understand USB architecture, communication protocols, descriptors, endpoints, and interfaces.
- ☐ Learn the fundamentals of developing and integrating USB device drivers in Linux.
- ☐ Implement USB driver operations and interact with USB devices using kernel APIs.

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### Module 5: Block Device Drivers & Implementation

- ☐ Learn the architecture and working principles of Linux Block Device Drivers.
- ☐ Understand block I/O operations, request handling, storage interfaces, and kernel APIs.
- ☐ Implement a basic block device driver and explore its operation within the Linux kernel.

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### Module 6: Embedded Protocols

- I2C Protocol
- SPI Protocol
- CAN Protocol

## Examination & Certification

| Category   | Theory           | Project |              | Total |
|------------|------------------|---------|--------------|-------|
| Paper Name | No. of Papers:01 | Project | Presentation |       |
| Marks      | 40               | 30      | 30           | 100   |

After successful completion of the course, candidate will get an online certificate with the following Grading Scheme:

| Marks Range                                         | Grade | Certificate Type |
|-----------------------------------------------------|-------|------------------|
| 85% and above                                       | S     | Graded           |
| 75-84%                                              | A     | Graded           |
| 65-74%                                              | B     | Graded           |
| 55-64%                                              | C     | Graded           |
| 50-54%                                              | D     | Graded           |
| <50%                                                | F     | Participation    |
| Attended the Course but not appeared in Examination | N     | Participation    |

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