LabVIEW CENTRE OF EXCELLENCE
C.V. Raman Global University, Bhubaneswar

LabVIEW Core 1

Sl. No	Topics	Theory Hours	Practical Hours	Total Hours
1	**Introduction to LabVIEW** What is LabVIEW, Parts of a VI, Front Panel, Block Diagram, Dataflow, Building a Simple VI.	1	1	2
2	**Troubleshooting and Debugging VIs** Correcting Broken Vis, Debugging Techniques, Error Handling.	1	1	2
3	*Quiz – 1 / Assignment – 1*			2
4	**Loops and Structures** For Loops, While Loops, Structure Tunnels, Shift Registers, Feedback Nodes, Timing a VI, Case Structures, Sequence Structures, Event Structure, Formula Nodes, MathScript.	7	7	14
5	**Modular Programming** Understanding Modularity, Building the Icon and Connector Pane, Using SubVIs.	1	1	2
6	*Quiz – 2 / Assignment – 2*			2
7	**Arrays and Clusters** Arrays, Common Array Functions, Auto – Indexing, Clusters, Cluster Operations, Error Cluster.	2	2	4
8	**Plotting Data** Types of Waveforms, Waveform Graphs, Waveform Charts, XY Graphs, Intensity Graphs and Charts, Customizing Graphs and Charts.	2	2	4
9	**Strings** String Controls and Indicators, String Functions, Formatting Strings.	1	1	2
10	**File I/O** Basics of File input/output, Choosing a File I/O Format.	1	1	2
11	*Quiz – 3 / Assignment – 3*			2
	Lab Test			2

Theory	16 Hours
Practical	16 Hours
Quiz/Assignment	06 Hours
Lab Test	02 Hours
Total	**40** Hours

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LabVIEW Core 2

Sl. No	Topics	Theory Hours	Practical Hours	Total Hours
1	**Variables** Local Variables, Global Variables	1	2	3
2	**Moving Beyond Dataflow** Asynchronous Communication, Queues, Event – Driven Programming.	2	2	4
3	*Quiz – 1 / Assignment – 1*			2
4	**Implementing Design Patterns** Design Patterns, Simple Design Patterns, Multiple Loop Design Patterns, Error Handlers, Generating Error Codes and Messages, Timing Design Pattern.	3	3	6
5	**Controlling the User Interface** VI Server Architecture, Property Nodes, Invoke Nodes, Control References.	2	2	4
6	*Quiz – 2 / Assignment – 2*			2
7	**Improving an existing VI** Refactoring Inherited Code, Typical Refactoring Issues.	1	1	2
8	**Deploying an application** Preparing the files, Build Specifications, Create and Debug an application.	1	2	3
9	*Quiz – 3 / Assignment – 3*			2
	Lab Test			2

Theory   10 Hours
Practical   12 Hours
Quiz/Assignment   06 Hours
Lab Test   02 Hours
Total   **30** Hours

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LabVIEW: DAQ and ARM Microcontroller

Sl. No	Topics	No. of Hours
1	Introduction to NI Hardware – DAQ Signal Accessory, NI USB – 6009	1
2	Measurement of Room Temperature using DAQ Signal Accessory /NI USB - 6009	1
3	Introduction to SCB–68, Measurement of Room Temperature using SCB – 68	2
4	Control of DC Motor using NI USB - 6009	2
5	Introduction to LabVIEW for ARM Microcontroller – ARM7	1
6	Creating a LabVIEW Project to display "LabVIEW Academy" on the LCD Screen of MCB2300 Kit	1
7	Creating a LabVIEW Project to make LED ON and OFF of MCB2300	1
8	Creating a LabVIEW Project that lights a LED on the MCB2300 when the input exceeds the threshold.	1
9	Creating a LabVIEW Project to scroll a text on the LCD of MCB2300	2
10	Introduction to LabVIEW for ARM Microcontroller – CortexM3	1
11	Creating a LabVIEW Project to demonstrate how to blink the status LED on EK-LM3S8962 Evaluation Board.	1
12	Creating a LabVIEW Project for Etch – A – Sketch using the EK-LM3S8962.	2
13	Creating a LabVIEW Project to demonstrate how to use Elemental I/O on the Luminary Micro EK-LM3S8962 to perform Digital I/O.	2
14	*Lab Test*	2
	Total No. of Hours	**20**

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LabVIEW: NI ELVIS, NI DE FPGA, NI Smart Camera

Sl. No	Topics	No. of Hours
1	Introduction to NI WSN Starter Kit	1
2	Hands on Session	1
3	Introduction to NI ELVIS	1
4	Testing the NI-ELVIS II Series	1
5	Measuring Values of Passive Components using NI ELVIS II	1
6	Operating the variable Power Supply of NI ELVIS II	1
7	Testing Diodes and Determining their polarity using NI ELVIS II	1
8	To plot Characteristic Curve of a Diode using NI ELVIS II	1
9	Introduction to NI DE FPGA Prototyping Board	1
10	Hands on Session	1
11	Introduction NI Smart Camera	1
12	Hands on Session	1
13	Introduction to NI LabVIEW Robotics	1
14	Hands on Session	1
15	Introduction NI LabVIEW Biomedical Toolkit	1
16	Hands on Session	1
17	*Quiz/Assignment*	2
18	*Lab Test*	2
	Total No. of Hours	**20**

LabVIEW CENTRE OF EXCELLENCE
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COURSE: LabVIEW Core – 1

DURATION: 40 Hours

ELIGIBLE BRANCHES:

Electrical Engineering / Electronics and Communication Engineering / Mechanical Engineering / Computer Science and Engineering

TARGET GROUP

Graduate and Undergraduate Engineering Students

OBJECTIVE

- Understand front panels, block diagrams, icons, and connector panes
- Create user interfaces with charts, graphs and buttons
- Use the programming structures and data types that exist in LabVIEW
- Use various editing and debugging techniques
- Create and save VIs for use as subVIs
- Display and log data

TRAINING METHODOLOGY

Explanation, Demonstration and hands-on practice.

COURSE CONTENTS

- Navigating LabVIEW
- Troubleshooting and Debugging Vis
- Implementing a VI
- Developing Modular Applications
- Arrays and Clusters
- Plotting Data
- Strings, File I/O

LabVIEW CENTRE OF EXCELLENCE
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COURSE: LabVIEW Core – 2

DURATION: 30 Hours

ELIGIBLE BRANCHES:

Electrical Engineering / Electronics and Communication Engineering / Mechanical Engineering / Computer Science and Engineering

TARGET GROUP

Graduate and Undergraduate Engineering Students with knowledge of LabVIEW Core – 1

OBJECTIVE

- Apply common design patterns that use queues and events
- Use event programming effectively
- Programmatically control user interface objects
- Evaluate file I/O formats and use them in applications
- Modify existing code for improved usability
- Prepare, build, debug, and deploy stand-alone applications

TRAINING METHODOLOGY

Explanation, Demonstration and hands-on practice.

COURSE CONTENTS

- Moving Beyond Dataflow
- Implementing Design Patterns
- Controlling the User Interface
- Improving an existing VI
- Deploying an application

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COURSE: LabVIEW: DAQ and ARM Microcontroller

DURATION: 20 Hours

ELIGIBLE BRANCHES:

Electrical Engineering / Electronics and Communication Engineering / Mechanical Engineering / Computer Science and Engineering

TARGET GROUP

Graduate and Undergraduate Engineering Students with knowledge of LabVIEW Core – 1

OBJECTIVE

- Design to enabled educators to easily teach microcontroller programming concepts
- Learn graphical programming, in conjunction with traditional embedded system concepts like interrupts handling, on-chip I/O and software optimization
- To design, implement, document, and test LabVIEW applications
- To reduce development time and improve application stability.

TRAINING METHODOLOGY

Explanation, Demonstration and hands-on practice.

COURSE CONTENTS

- Introduction to NI USB – 6009, DAQ Signal Accessory, SCB – 68
- Introduction to LabVIEW Embedded Module for ARM Microcontrollers.
- Getting Started with Cortex – M3
- Programming Using Cortex – M3
- Getting Started with ARM 7
- Programming Using ARM7

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COURSE: LabVIEW: NI ELVIS, NI DE FPGA, NI Smart Camera

DURATION: 20 Hours

ELIGIBLE BRANCHES:

Electrical Engineering / Electronics and Communication Engineering / Mechanical Engineering / Computer Science and Engineering

TARGET GROUP

Graduate and Undergraduate Engineering Students with knowledge of LabVIEW Core – 1

OBJECTIVE

- Gaining knowledge on NI ELVIS – II, Robotics, Smart Camera, Biomedical Toolkit, Wireless Sensor Network kit.
- Create & compile your LabVIEW FPGA
- Acquire and generate analog and digital signals, control timing, synchronize operations, and implement signal processing on the FPGA
- Design and implement applications using the LabVIEW FPGA module

TRAINING METHODOLOGY

Explanation, Demonstration and hands-on practice.

COURSE CONTENTS

- Introduction to NI DE FPGA,
- NI ELVIS – II,
- NI WSN,
- NI Smart Camera,
- NI Robotics.