|  |  |
| --- | --- |
|  | **NAGARJUNA COLLEGE OF ENGINEERING & TECHNOLOGY**  **(An Autonomous under VTU)**  **DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGG.**  6th Semester 2019-2020  **COURSE HANDOUT** |

**Course Code :** 16HOE661

**Course Title :** LabVIEW - Level I

**Course Teachers :** Mr.VinayKumar S R,MrsSreevani N

**Course Co-ordinator :** Mr.Vinaya Kumar S R

**1. COURSE DESCRIPTION:**

This Course covers the fundamentals of graphical coding system and developing basic level of Lab-VIEW coding. The main topics covered are different component of Lab-VIEW operating toolsstate machine for a specific problem and integrated coding solution for analysis and presentation with MyRio hardware using accelerometer.

**2. COURSE OBJECTIVE:**

* Understand the fundamental of graphical coding system.
* Learn to develop basic level of Lab-VIEW coding.
* Study the different component of Lab-VIEW operating tools.
* Study and develop state machine for a specific problem.
* Develop integrated coding solution for analysis and presentation with MyRio hardware using accelerometer.

**3. COURSE PLAN:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Class Sl No** | **Module and Title / Page No.** | **Topics to be covered** | **% of portions covered** | |
| **Covered in the chapter** | **Cumulative** |
|  | **Module I**  **Introduction to Error control Coding**  **T2: Page No.**  **20-46.**  **R2: Page No.**  **2.2-2.6.** | Lab-VIEW programming concepts, environment and Softwareconstructs: | 20% | 20% |
|  | Data flow, Polymorphism, Front panel window, |
|  | block diagram, and connector pane, |
|  | Menus and palettes, Configuration options. Controls. |
|  | indicators, IO controls,refnums Terminals, constants, |
|  | nodes, update modes,legends of charts and graphs. |
|  | Mechanical action of Boolean objects Property Nodes. |
|  | Numeric, string, Boolean, and path data types. |
|  |  | Array and cluster data types. |  |  |
|  |  | Shift registers, Case, Sequence and Event structures. |  |  |
|  | **Module II**  **Binary Cyclic Codes**  **T2 Page No.47- 64**  **R2 Page No.4.1-4.12.** | Programming, Data communication | 20% | 40% |
|  | synchronization VIsand functions |
|  | Conversion, comparison, and manipulation, |
|  | Timing and Timing functions related to Timed structures. |
|  | Data storage and file I/O formats, |
|  | Waveform and waveform file I/O, Dynamic |
|  | User events Local, global, and shared variables Data Socket TCP |
|  | UDP Notifiers Queues Semaphores Property Nodes, and Invoke Nodes.  Nodes, and Invoke Nodes. |
|  | **Module III**  **Convolution Codes**  **T2 Page No.115-130** | Error handling VIs and functions | 20% | 60% |
|  | Error clusters Dialog and User Interface VIs Custom error codes. |
|  | Design patterns: Simple state machine |
|  | User interface event handler, Queued message handler |
|  | Producer/consumer (data) and producer/consumer (events) |
|  | Functional global variables |
|  | **Module IV**  **Source Coding**  **T1 Page No.156-163. R2 Page No.7.1-7.7.** | Sub VI design:SubVI creation methods | 20% | 80% |
|  | Connector panes and connection types |
|  | Polymorphic subVIs, Options relatedDebugging tools and techniques |
|  | Debugging tools, Error list window |
|  | Execution highlighting |
|  | Breakpoints |
|  | single stepping, Generic and custom probes |
|  | Debugging practices and techniques for different situations. |
|  | **Module V**  **Information theory**  **T2 Page No.91-114.**  **R2 Page No.9.1-9.11** | VI design and documentation (style) practices: | 20% | 100% |
|  | Refer to the LabVIEW Style Checklist topic of the LabVIEW Help for information on the following items |
|  | i.User interface design and block diagram layout  ii. Modular and hierarchical design |
|  | iii.SubVI icons and connector pane layout (standard)  iv.Properties  v.Documenting Vis |
|  | Memory, performance, and determination  a.Tools for identifying memory and performance issuesProfile memory and performance, Show buffer allocations and VI metrics  b.Programming practices |
|  | Enforcing dataflow, User interface updates and response to user interface controls |
|  | Data type selection, coercion |
|  | buffer allocation, Array, string, and loop operations |

**4. TEXT BOOK:**

**T1.**LabVIEW - Getting Started with LabVIEW”, M/s National Instruments, 201373427J-01.

**T2.**Jovitha Jerome: “Virtual instrumentation using labview”, PHI Learning Pvt. Ltd., 2010.

**T3.**Hans-Petter Halvorsen: ”Introduction to LabVIEW,” University College of Southeast, Norway.

**T4.**S. Sumathi, P. Surekha: “LabVIEW based Advanced Instrumentation Systems”, Springer.

**T5.**Lab manual provided by Dept. of Civil Engg., NCET.

**5. REFERENCE BOOKS:**

**R1.**Jeffrey Travis, Jim Kring: “Introduction to Graphical Programming with LabVIEW”,

Pearson, 2006.

**R2.**Malan Shiralkar: “LabVIEW Graphical Programming Course Collection”, National

Instruments.

6. EVALUATION SCHEME:

|  |  |  |
| --- | --- | --- |
| **Component** | **Weightage** | **Date** |
| CIE 1 | 20% |  |
| CIE 2 | 20% |  |
| Makeup CIE | 20% |  |
| AAT-1 (Surprise Test) | 5% |  |
| AAT 2 (Quiz) | 5% |  |
| SEE | 50% |  |

**7. COURSE OUTCOMES:**

On successful completion of this module, students should be able to:

* Formulate basic aspects of the graphical programming using LabVIEW 2016.
* Develop LabVIEW coding for a specific problem of datalogging, measurement and presentation.
* Handle the error function and errors in the LabVIEW coding.
* Develop coding for data handling and Analysis on the acquired data.
* Design a state machine LabVIEW coding for an applied problem

**Course Co-ordinator HOD**

Mr.Vinay Kumar S R Dr. Nagesh K N