

Liverpool John Moores University

Title: Applied Instrumentation
Status: Definitive
Code: **5312SBC** (124876)
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering
Teaching School/Faculty: The Sino-British College

Team	Leader
Colin Wright	Y

Academic Level: FHEQ5 **Credit Value:** 20 **Total Delivered Hours:** 72
Total Learning Hours: 200 **Private Study:** 128

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	24
Tutorial	48

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	Design of a simple application.	25	
Report	AS3	Mini project encompassing more complex design strategies	75	

Aims

To introduce the students to a graphical based programming language that enables the user to program via a CAD style environment enabling them to create virtual instruments as a base for data acquisition and instrument control.

Learning Outcomes

After completing the module the student should be able to:

- 1 Use LabView to design a simple control and instrumentation system simulation
- 2 Use LabView designs as subVI's in more complicated designs
- 3 Control external hardware using LabView
- 4 Perform data collection, analysis and storage.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Design Assignment 1	1		
Mini Project	2	3	4

Outline Syllabus

LabVIEW environment

How LabVIEW differs from traditional programming languages.

Define a VI, how to open, create and save VI's and templates.

Front panels

How they function and what are they used for.

What components make up the front panel.

Block diagrams

How they differ to front panels.

How they are constructed.

Data Flow

What is the dataflow paradigm.

Loops

Different types of loops in LabVIEW.

Controlling execution using loops.

Shift registers

What are the functions of shift registers.

How and when to use them.

Case Structures

How to construct a case structure.

How they differ from other structures in LabVIEW.

Visual Displays: Charts & Graphs

Difference between charts and graphs and how to select and use them

Displaying several signals in the same chart.

Using Built in Functions

Performing data analysis, for example FFT using built in functions

Strings & File I/O

String operations and conversions.

Using files to input data into a LabVIEW application.

Saving data from a LabVIEW program.

Connecting external hardware

Connecting external instruments and logging data

Connecting simple I/O boards

Learning Activities

By a series of seminars and practical sessions. Students will be encouraged to work independently.

Notes

This module introduces students to a graphical based programming language that enables the user to program via a CAD style environment enabling them to create virtual instruments as a base for data acquisition and instrument control.