

## Liverpool John Moores University

Title: Applied Instrumentation  
Status: Definitive  
Code: **5312ELE** (121423)  
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering  
Teaching School/Faculty: Engineering

Team	Leader
Dingli Yu	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.