

## Liverpool John Moores University

Title: Applied Instrumentation  
Status: Definitive  
Code: **5312CIT** (125303)  
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering  
Teaching School/Faculty: Changshu Institute of Technology

Team	Leader
Colin Wright	Y

**Academic Level:** FHEQ5      **Credit Value:** 20      **Total Delivered Hours:** 50  
**Total Learning Hours:** 200      **Private Study:** 150

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	32
Practical	16

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam	Examination	60	2
Report	AS2	Programming	30	
Essay	AS3	Coursework	10	

### Aims

*This module is designed to develop the G programming language required to design and implement applications in the engineering.*

### Learning Outcomes

After completing the module the student should be able to:

- 1 Demonstrate capability with graphical programming environment, learning graphical programming language and G programming language
- 2 Use LabVIEW to design a simple control and instrumentation system simulation
- 3 Use LabVIEW to control external hardware
- 4 Perform data collection, analysis and storage

## Learning Outcomes of Assessments

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

Examination	1		
Programming	2	3	4
Coursework	2	3	4

## Outline Syllabus

### 1 LabVIEW Basics

#### 1.1 The LabVIEW Environment

#### 1.2 Panel and Diagram Windows

#### 1.3 Palettes -Tools Palette, Controls Palette, Functions Palette

#### 1.4 Opening, Loading, and Saving VIs

#### 1.5 LabVIEW Help

### 2 Virtual Instruments

#### 2.1 Numeric Controls and Indicators

#### 2.2 Boolean Controls and Indicators

#### 2.3 Data Flow Programming

#### 2.4 Building a VI

### 3 Structures

#### 3.1 Flat Sequence Structures

#### 3.2 The For Loop

#### 3.3 The While Loop

#### 3.4 Shift Registers and Feedback Nodes

#### 3.5 Case Structures

#### 3.6 The Formula Node

#### 3.7 Local Variables

### 4 Arrays and Clusters

#### 4.1 Arrays

#### 4.2 Array Functions

#### 4.3 Clusters

#### 4.4 Cluster Functions

### 5 Charts and Graphs

#### 5.1 Waveform Charts

#### 5.2 Waveform Graphs

#### 5.3 XY Graphs

#### 5.4 Customizing Charts and Graphs

- 6 *Strings and File I/O* 478
  - 6.1 *Strings*
  - 6.2 *Strings Functions*
  - 6.3 *File I/O*
  - 6.4 *File I/O Functions*
- 7 *Data Acquisition*
  - 7.1 *Components of a myDAQ*
  - 7.2 *Analog Input*
  - 7.3 *Analog Output*
  - 7.4 *Digital Input and Output*
  - 7.5 *Using the DAQ Assistant*

## **Learning Activities**

A series of lectures with some laboratory activities using LabVIEW

## **Notes**

The modules introduces students the syntax of G programming language, the platform of programming, and its application to electronics.