Liverpool John Moores University

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Title:	Applied Instrumentation
Status:	Definitive
Code:	**5512USST** (126463)
Version Start Date:	01-08-2021
Owning School/Faculty:	Engineering
Teaching School/Faculty:	University of Shanghai For Science and Technology

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	AS2	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	Apply LabView to design a simple control and instrumentation system simulation
2	Develop LabView designs as subVI's in more complicated designs
3	Manage and control external hardware using LabView
4	Manage 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 lectures and tutorial 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.