

Title:	LabVIEW Visual Programming APPROVED
Long Title:	LabVIEW Visual Programming
Module Code:	INTR7010
Credits:	5
NFQ Level:	Intermediate
Field of Study:	Interdisciplinary Engineering
Valid From:	Semester 1 - 2017/18 (September 2017)
Module Delivered in	4 programme(s)
Module Coordinator:	JOSEPH CONNELL
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Module Description:	Introductory programming courses are typically designed to teach programming using a particular programming language. For many students, dealing with the syntax and details of a programming language is a major obstacle to learning how to use computers for problem solving. Often students who take introductory computer science courses are not going to use the language used in their course in their future employment. This module introduces the student to graphical programming using languages such as LabVIEW's G. Students will learn how to use a visual programming language to quickly achieve the same results as a conventional programming language as well as the fundamentals of data acquisition and process control.
Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
LO1	Describe the fundamental ideas of data acquisition
LO2	Design solutions to real world problems using a visual programming language
LO3	Debug a visual program
Pre-requisite learning	
Module Recommendations	
<i>This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named CIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).</i>	
No recommendations listed	
Incompatible Modules	
<i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module. You may not earn additional credit for the same learning and therefore you may not enrol in this module if you have successfully completed any modules in the incompatible list.</i>	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements	
<i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed. You may not enrol on this module if you have not acquired the learning specified in this section.</i>	
No requirements listed	
Co-requisites	
No Co Requisites listed	

Module Content & Assessment

Indicative Content

Introduction to Visual Programming

Introduction to graphical dataflow diagrams, Graphical structures that enhance dataflow diagrams, Properties of dataflow programming languages, Overview of LabVIEW G and Microsoft Visual Programming Language(MVPL).

LabVIEW Basics

Introduction to the LabVIEW environment, Virtual Instruments (VIs), block diagrams, terminals, nodes, wires, creating a VI, wiring a VI, running a VI.

Basic Controls and Indicators

Numeric and boolean controls and indicators, strings, paths, custom controls and indicators.

VI Libraries and Debugging

Reasons for using VI libraries, How to use VI libraries, Debugging techniques, single stepping a VI, execution highlighting and breakpoints.

Controlling Program Execution

The FOR loop, The WHILE loop, shift registers, case structures, sequence structures, the formula node.

Arrays and Clusters

Introduction to arrays, array controls and indicators, two dimensional arrays, functions for manipulating arrays, polymorphism, clusters.

Charts and Graphs

Graphs, charts and waveforms.

Strings and File input/output

Strings, String functions, file i/o.

Data Acquisition

Introduction to data acquisition, types of signal, signal characteristics, signal conditioning, sampling, Nyquist sampling theorem, analogue i/o, digital i/o, instrument control, fundamentals of process control.

Assessment Breakdown

%

Course Work

100.00%

Course Work

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Other	assignment-design a simple visual program	1,2,3	20.0	Week 7
Project	design the a visual program based solution to a given problem	1,2,3	40.0	Week 12
Performance Evaluation	continuous assessment of performance in lab	1,2,3	40.0	Every Week

No End of Module Formal Examination

Reassessment Requirement

Coursework Only

This module is reassessed solely on the basis of re-submitted coursework. There is no repeat written examination.

The institute reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time

<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lab	2 x 2 hour labs	4.0	Every Week	4.00
Independent & Directed Learning (Non-contact)	autonomous student learning	3.0	Every Week	3.00
Total Hours				7.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				4.00

Workload: Part Time

<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lab	1 x 3 hour lab	3.0	Every Week	3.00
Independent & Directed Learning (Non-contact)	autonomous student learning	4.0	Every Week	4.00
Total Hours				7.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				3.00

Module Resources
<i>Supplementary Book Resources</i>
<ul style="list-style-type: none"> • Jeffrey Travis, Jim Kring, <i>LabView for Everyone</i>, 3 Ed., Prentice Hall [ISBN: ISBN: 0-13-185672-3] • Gary W. Johnson, Richard Jennings 2006, <i>LabVIEW Graphical Programming</i>, 4 Ed., McGraw-Hill Professional [ISBN: ISBN-10: 0071451463 ; ISBN-13: 978-0071451468] • Bruce Mihura 2001, <i>LabVIEW for Data Acquisition</i>, Prentice Hall PTR [ISBN: ISBN-10: 0130153621; ISBN-13: 978-0130153623] • Rick Bitter, Taqi Mohiuddin, Matt Nawrocki 2006, <i>LabVIEW: Advanced Programming Techniques</i>, CRC [ISBN: ISBN-10: 0849333253 ; ISBN-13: 978-0849333255] • Jeffrey Y. Beyon 2000, <i>Hands-on Exercise Manual for LabView Programming Data Acquisition and Analysis</i>, Prentice Hall PTR [ISBN: ISBN-10: 0130303682 ; ISBN-13: 978-0130303684]
<i>This module does not have any article/paper resources</i>
<i>Other Resources</i>
<ul style="list-style-type: none"> • Website: <i>Labview home page</i> http://www.ni.com/labview/ • Website: <i>Labview WIKI</i>, http://wiki.lavag.org/Home

Module Delivered in			
Programme Code	Programme	Semester	Delivery
CR_EEPSY_8	<u>Bachelor of Engineering (Honours) in Electrical Engineering</u>	5	Elective
CR_EELES_8	<u>Bachelor of Engineering (Honours) in Electronic Engineering</u>	5	Elective
CR_EELEC_7	<u>Bachelor of Engineering in Electrical Engineering</u>	5	Elective
CR_EELXE_7	<u>Bachelor of Engineering in Electronic Engineering</u>	5	Elective