

**CENTRE FOR DISTANCE AND CONTINUING EDUCATION  
UNIVERSITY OF PERADENIYA**

**PROGRAMME SUMMARY**

The programme of study consists of 15 credits and the structure is presented below.

**Title of the Course:** Advanced Certificate in Laboratory Handling

**Credits:** 15 Credits

**Duration:** 06 Months

**Target Group:** Unskilled employees in schools or universities, job seekers as laboratory attendants and people dealing with laboratory items.

**Minimum Qualification:** Pass in GCE O/L examination with mathematics and science subjects *or* 05 years work experience in a science laboratory.

Code & Course	Course Content
<b>ACL 2101:</b> Ethics and Motivation (1 cr)	Define the term ethics. Ethics towards social justice; human and animal ethics; concept of motivation; types of motivation; enhancement of intrinsic motivation; use of ethics and motivation for healthy and smooth functioning in laboratory work.
<b>ACL 2102:</b> Laboratory Management (1 cr)	Basic Principles of Management: Importance of laboratory management and the general practice that should be followed in the laboratory. Laboratory Techniques in Science Laboratories including Chemistry, Physics and Biology. Laboratory Etiquette; Introduction to Data storage and Interpretation; Quality; Inventory; Layout of Laboratory Organization; Laboratory Safety; Waste Disposal.
<b>ACL 2103</b> Basic Mathematics for Laboratory Staff (1 cr)	Basic Mathematics, Number Systems, Units, Linear Equations, Quadratic Equations. Inequalities, Mathematical Simplifications, Ratios, Mixtures, Percentages, Simple Interest. and Compound Interest, Basic Geometry and Basic Statistics. Introduction to Data storage and Interpretation; Inventory; Laboratory Organization
<b>ACL 2104</b> Basic English for Laboratory Staff (2 cr)	Tenses (simple present/present continuous/simple past/past continuous/future) question form, prepositions (place, movement, time), adjectives & adverbs, relevant vocabulary (singular/plural forms), modals (can/have etc.), instruction form, giving precautions, simple sentence structures, reading notices, lab manuals, labels and simple descriptions, listen and follow instructions, informal greetings and introductions , giving directions, informal discussions on familiar topics.
<b>ACL 2105</b> Basic ICT Skills (2 cr)	Main components of computer systems: computational/commanding units, memory hierarchies, input/output devices and storage devices. Software: system and application software. Microcomputer applications: word processing, spreadsheet processing and electronic presentations. Internet and communication technologies: services of the internet, emails, voice over IP services, file hosting services in the cloud. Ethics in ICT: ethics and best practices of email composing, social and professional media. Multimedia devices and applications: multimedia projectors, multimedia, video editing, audio editing. Online learning management systems.
<b>ACL 2106</b>	Introduction to materials: The types of materials used in a workshop, their properties and uses will be explained with demonstration. Wood work:

<p><b>Workshop Practice</b> (2 cr)</p>	<p>Class, type, strength, properties and used of common wood. Training to use various tools for cutting, drilling, joining and fixing of wood. Metal work: The use of lathe machines for milling, drilling, cutting and shaping of metal objects. The joining parts using arc welding, gas welding and spot welding appropriately. Glass work: Identification of various types of glass, their properties and uses. Training to repair and construct simple glass items. Repairs and maintenance: Faults in laboratory instruments and repair or replace with suitable parts. Training to service and carry out regular maintenance of laboratory equipments..</p>
<p><b>ACL 2107</b> <b>Physics Laboratory Handling</b> (2 cr)</p>	<p>Basic Physics: The relevant basic theory knowledge to understand Physics instruments and experiments. Measuring instruments: Identification of the measuring instruments in the physics laboratory. Reading the least count and the scale of the measuring instruments. Handling: The procedure and methods of cleaning, servicing, handling and storing measuring instruments appropriately. The maintenance and repair of commonly used instruments in school laboratory. Responsibilities: Maintaining healthy relationship with teachers and students. Supporting to purchase the items and consumables for conducting experiments and to handle emergency situations.</p>
<p><b>ACL 2108</b> <b>Chemistry Laboratory Handling</b> (2 cr)</p>	<p>Atoms, Molecules &amp; Chemical Reactions: Introduction to matter and atoms, atomic models. Bonding, and molecules. Introduction to chemical reactions and factors affecting reaction rates. Examples of some simple reactions, including acid-base reactions, precipitation reactions, complex formation (colour change reactions). Classes of Chemicals: Hazard based classification of chemicals; storage, personal health and safety. Storage of chemicals. Handling and maintenance of glassware: Introduction to function and handling of common laboratory glassware, including test tubes, common containers, volumetric containers, pipettes, burettes. Preparation of material for laboratory classes: Preparation of solutions and setting up laboratory equipment, including balances and instruments. Waste disposal: Disposal of broken glassware, chemicals and other waste</p>
<p><b>ACL 2109</b> <b>Biology Laboratory Handling</b> (2 cr)</p>	<p>Basic information for laboratory operations; storing and management of required chemicals; handling equipment, glassware and consumables, and safety procedures; hands on experiences for instruments (pH meters, fume hood, centrifuge, laminar flow, freezers); preparation of mixing buffers and other simple solutions, basic staining techniques. Skills on scientific observations and drawing. Laboratory practices in herbarium sheet preparation; specimen collection and handling; preservation of animal and plant materials; slide mounting; culturing microorganisms; dissections of plants and animal, through lectures and hands-on training.</p>