Science Council
Laboratory technician

LEARNING GUIDE

Optional route – Chemistry

This document contains content knowledge that should be delivered as part of a high quality laboratory technician apprenticeship within the chemical sciences.

This document should be used in conjunction with the core.

Topic/Subject	Links to KSB's	Coverage overview	Suggested learning hours
Use and importance of following Standard Operating Procedures (SOPs), including what a SOP is, who it is applicable to and how to access SOPs for a given activity	S6, K1, K21	Quality Systems, Continuous Improvement, Accreditation of Laboratories ISO and Audit bodies	15
Calibration and testing of chemical science equipment to ensure it is fit for use	S2, S7, S8, S16, K21	Current calibration status of equipment. Principles and importance of accurate data collection. Implications if not done. Reporting when faulty including traceability.	10
Large molecules	K21	Proteins, carbohydrates and lipids are the three key groups of large molecules. Understanding of structures to understand function related to their properties. More depth to inorganic and organic chemistry.	15
Small molecules	K21	Case studies into function within Pharma and other sectors. More depth to organic/inorganic chemistry. Synthetic routes, optimisation inc sustainability.	15
Deeper understanding of structure of materials and the relationship with physical and chemical properties: including physical properties. Reactivity	K21	More depth to physical chemistry and links to analytical. More depth and application of the area outlined in core.	15
Rates of reaction and energy changes: including basic theory on kinetics and thermodynamics. Effects of changes of temperature, use	K21	More depth to physical chemistry. More depth and application of the area outlined in core.	15

of catalysts; enthalpy and entropy			
Pharmaceutical/medicinal chemistry	K21	Applied nature of this knowledge. How it used in industry and across the sector they may work in. Organic chemistry, touching on pharmacology, metabolism. Could link through to aspects of computational chemistry and data analysis.	15
Petrochemical chemistry	K21	Applied nature of this knowledge. Oil and gas chemistry, plastics; links to green chemistry.	15
Nuclear chemistry	K21	Applied nature of this knowledge. Working with radioactive material, analysis, energy chemistry, nuclear decommissioning.	15
Green/enviormental chemistry	K21	Sustainability. Future of the world and how new techniques and materials will need to be used to drive environmental improvements. Atmospheric chemistry, water chemistry etc.	15
Materials science: applications including polymers, alloys and composites. Introduction into nanoscience	K21	Applied nature of this knowledge. Nanotech, materials linked to green chemistry, graphene, solar cells etc.	15