



CRCL-ITEC PROGRAMME (SEPTEMBER, 2026)

21st September to 25th September, 2026 (01-Week)

Training Programme on Pharmacopoeial and Forensic Testing of Opium, Opioids and Related Narcotic Drug Formulations

(As per Pharmacopoeia methods, UN and Standard Laboratory Practices)

1. Background

Opium and its derivatives, including natural alkaloids, semi-synthetic opioids, and pharmaceutical preparations, are subject to strict international control. Laboratory identification and quantification of these substances are critical for customs enforcement, narcotics control, public health protection, and legal adjudication.

This programme provides structured training in pharmacopoeial and forensic analysis of opium, opium alkaloids, opioid pharmaceutical preparations (e.g. Corex® syrup, Buprenorphine) and illicit opioids (Heroin and its metabolite 6-Monoacetylmorphine), with emphasis on British Pharmacopoeia (1998) and internationally accepted analytical practices.

2. Objectives

The programme aims to:

- Develop technical understanding of **opium, opioids, and related narcotic substances**
- Familiarize participants with **BP monographs and UN-recommended methods**
- Build hands-on competency in **qualitative and quantitative analysis**
- Strengthen laboratory capacity for **regulatory, enforcement, and evidentiary purposes**

3. Target Participants

Chemists, Scientific Officers, Customs and Revenue Laboratory Officers, Narcotics Control and Forensic Laboratory Personnel, Drug Regulatory Officials.

4. Duration

Five (05) Days

(Theory: 2.5 days | Practical: 2.5 days)



5. Course Structure

MODULE I - THEORETICAL COMPONENT

Day 1: Welcome and Registration of participants

- ✧ Inaugural Session & Introduction
- ✧ Overview of Central Revenues Control Laboratory
- ✧ Laboratory Tour

Regulatory Framework and Classification

❖ Overview of Narcotic Drugs and Psychotropic Substances

- ✧ Natural, semi-synthetic and synthetic opioids
- ✧ Pharmaceutical vs illicit narcotics

❖ International and National Control Regimes

- ✧ UN Drug Control Conventions (1961, 1971, 1988)
- ✧ Role of International Narcotics Control Board (INCB)
- ✧ Overview of National Narcotics Legislation

❖ Pharmacopoeial Standards

- ✧ British Pharmacopoeia (1998): scope and relevance
 - ✧ Pharmacopoeial monographs vs forensic methods
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Day 2: Opium and Opioids – Chemical and Analytical Aspects

❖ Opium and Opium Alkaloids

- ✧ Morphine, Codeine, Thebaine, Papaverine, Noscapine
- ✧ Natural variability and processing effects

❖ Semi-Synthetic and Synthetic Opioids

- ✧ Heroin (Diacetylmorphine): synthesis, characteristics
- ✧ 6-Monoacetylmorphine (6-MAM): forensic significance
- ✧ Buprenorphine: structure, pharmacology and misuse patterns

❖ Pharmaceutical Preparations

- ✧ Codeine-based cough syrups (e.g. Corex®)
- ✧ Formulation composition and analytical challenges



- ✧ Differentiation between therapeutic and abusive use

Day 3 (First Half): Analytical Principles and QA

❖ Analytical Techniques

- ✧ Acid-base extraction and clean-up
- ✧ Colour tests and spot tests
- ✧ TLC, HPLC, GC and GC-MS (overview and applicability)

❖ Quality Assurance and Laboratory Practices

- ✧ Sampling, sealing and chain of custody
- ✧ Reference standards and calibration
- ✧ Documentation and validation

MODULE II - EXPERIMENTAL / PRACTICAL COMPONENT

Day 3 (Second Half): Sample Handling and Preparation

❖ Sample Types and Preparation

- ✧ Raw opium and opium derivatives
- ✧ Pharmaceutical liquids (cough syrups)
- ✧ Injectable and tablet formulations (Buprenorphine)

❖ Extraction and Clean-Up Procedures

- ✧ Alkaloid extraction from solid and liquid matrices
- ✧ Removal of excipients and interferons

Day 4: Identification and Qualitative Analysis

❖ Identification Tests

- ✧ Presumptive chemical tests
- ✧ TLC profiling of opium alkaloids
- ✧ Identification of heroin and 6-MAM
- ✧ Differentiation between morphine, heroin and metabolites

❖ Instrumental Identification

- ✧ HPLC profiling of opioids
- ✧ GC/GC-MS confirmation (demonstration / exposure)



Day 5: Quantitative Analysis and Reporting

❖ Quantitative Estimation

- ❖ Morphine content in opium (BP method)
- ❖ Codeine quantification in cough syrup formulations
- ❖ Assay of Buprenorphine formulations
- ❖ Determination of heroin content in seized samples

❖ Result Interpretation

- ❖ Pharmacopoeial limits and regulatory thresholds
- ❖ Forensic interpretation of heroin and 6-MAM findings
- ❖ Common analytical errors and precautions

❖ Reporting and Legal Considerations

- ❖ Pharmacopoeial and forensic report formats
- ❖ Evidentiary value of analytical results
- ❖ Expert testimony considerations (overview)

❖ Valedictory Session /Closing Ceremony

Expected Learning Outcomes

Participants will be able to:

- ❖ Identify and analyse **opium, opium alkaloids, heroin, 6-MAM and buprenorphine**
 - ❖ Test **codeine-based pharmaceutical preparations** such as cough syrups
 - ❖ Apply **BP, UN and standard forensic methods** confidently
 - ❖ Prepare **accurate, defensible laboratory reports** for regulatory and enforcement purposes
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Optional Advanced Modules

- ❖ Comparison of **BP, IP, USP and UNODC methods**
 - ❖ Case studies on narcotic seizures and court outcomes
 - ❖ Advanced instrumental methods (LC-MS/MS)
 - ❖ Laboratory safety in handling controlled substances
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Working Hours and Break Schedule

- ✧ Working Hours: 09:30 hrs to 18:00 hrs
- ✧ Morning Tea Break: 11:00 hrs – 11:15 hrs
- ✧ Lunch Break: 13:00 hrs – 14:00 hrs
- ✧ Afternoon Tea Break: 16:00 hrs – 16:15 hrs
