



AL020: Practical Problem Solving in Chemical Analysis

Training Description:

Almost all analytical courses are technique oriented. Each tends to be reviewed in depth, but in isolation and without reference to other methods. What distinguishes this course is that it takes a multi-disciplined and integrated look at analytical techniques, with emphasis on the strengths and limitations of each in a problem-solving context. This course is designed to give a practical approach to the solution of method problems and technical problems that may require multiple technologies. It will cover proper sampling procedures, most of the various analytical and physical measurement tools available for problem solving, including separation methods and classical and instrumental techniques. Additionally, the course will cover the important computer procedures that can be used in the analysis of the data. During the 5 days of this course, the instructor and participants will practice our approach on examples and participants' problems. Participants are encouraged to bring several problems with them to the course.

Training Objective:

By the end of the training, participants will be able to:

- ✓ Solve problems in cost effective and timely manner
- ✓ Acquire an integrated overview of many techniques and procedures used in modern analytical and physical measurement laboratories for polymers, petrochemicals, industrial chemicals and related materials.
- ✓ Assess values and limitations of each technique and be prepared to make practical choices to apply in the solution of difficult problems
- ✓ Evaluate the importance of sampling, separation procedures and data treatment in problem solving
- ✓ Have an opportunity to get help with your own problems in one of the three scheduled workshops.

Training Designed for:

This course covers systematic techniques in practical problem solving in chemical analysis for experienced professionals including scientists, analysts, chemists, supervisors, engineers, managers and university professors. Further, those who are involved with characterizing unknowns and handling difficult analytical problems in research (R&D and R&T), quality control, plant support, regulatory compliance or customer support will find this course extremely useful.

Training Program:

DAY ONE:

- ❖ PRE-TEST
- ❖ Introduction & Objectives Defining the Problem
 - Problem Solving Perspectives
 - Types of Problems, Deciding on Information
 - Regulatory Issues, Business Issues
- ❖ Spectroscopy—Qualitative & Quantitative Techniques
 - UV-VIS, Fluorescence
 - Mid-Infrared, Near Infrared

- NMR, Mass Spectroscopy, Raman Spectroscopy

DAY TWO:

- ❖ **Physical Properties – Bulk**
 - Solids, Density
 - Viscosity, Particle Characterization
- ❖ **Classical Methods**
 - Titrimetry, Voltammetry
 - Atomic Spectroscopy
- ❖ **Workshop I**
 - Instructor's Examples
- ❖ **Chromatography**
 - GC, HPLC
 - TLC, Chiral
 - Method Validation

DAY THREE:

- ❖ **Physical Properties – Colligative**
 - Solution Viscosimetry
 - Molecular Weight
 - SEC, Rheology
 - Thermal Analysis
- ❖ **Microscopy**
 - Optical, Electron, Special Techniques
- ❖ **Separations**
 - Filtration, Extraction
 - Distillation Centrifugation, SPE and SPME

DAY FOUR:

- ❖ **Workshop II**
 - Problems Submitted by Participants
- ❖ **Multivariate Analysis**
 - Statistical Design, Data Analysis, Chemometrics
- ❖ **Process Analytical Technology**
 - Defining Processes, Teamwork, Cost Justification
- ❖ **Sampling, Record Keeping and LIMS**
 - Techniques for Solids, Liquids and Gases
 - Containers, Labels
- ❖ **Practical Sessions**
 - This hands-on, highly-interactive course includes real-life case studies and exercises

DAY FIVE:

- ❖ **Sampling, Record Keeping and LIMS (cont'd)**
 - Record Keeping, Chain of Custody, LIMS
- ❖ **Summary: The Multidisciplined Approach**
 - Applications to R&D
 - Applications to Manufacturing
 - Regulatory & Litigation Issues

- Separations, Method Choice
- ❖ Workshop III
 - Problem Solving in Petrochemicals, Polymers and other Fields
 - Problems Submitted by Participants
- ❖ Course Conclusion
- ❖ POST-TEST and EVALUATION

Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request”.

Please note that the above topics can be amended as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

As per the course location - This rate includes participant’s manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Prayer Break & Lunch)
13:30 - 15:00	Last Session

For training registrations or in-house enquiries, please contact:

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Training & Career Development Department

