The Chemical Analysis of Cannabis plant-derived samples

I. Module 1 Sample Preparation
   a. Sample Collection
   b. Relevance of plant sample dry weight
   c. Extraction and sample preparation of plant samples for potency analysis
   d. Solid-phase extraction sample clean-up
   e. Knowledge check

II. Module 2: Introduction to GC/ HPLC and MS
   a. Gas chromatography (GC) instrumentation and applications
   b. High-performance liquid chromatography (HPLC) instrumentation and applications
   c. Mass spectrometry (MS) instrumentation and applications
   d. Relative merits of GC/FID, GC/MS, HPLC/UV and HPLC/MS
   e. Knowledge check

III. Module 3: Potency Determination Analysis Techniques
   a. Potency due to what?
   b. Relative merits of LC/UV, LC/MS and spectroscopic techniques
   c. Principles of quantitative analysis
      i. Calibration curve
      ii. Reference standards
      iii. Internal standards
   d. Example applications
   e. Knowledge check

IV. Module 4: Pesticide Analyses
   a. Why pesticides? How many?
   b. Chemical diversity and detection limits required
   c. QUECHERS for sample preparation
   d. Tandem mass spectrometry
      i. GC/MS/MS
      ii. LC/MS/MS
      iii. Example applications
V. Module 5: Terpene Analyses
   a. Why terpenes?
   b. Diversity of chemical structures
   c. Sample preparation
   d. Head space sample analysis
   e. Chemical analysis by GC techniques
   f. Knowledge check

VI. Module 6: Mold and Mycotoxin Determination
   a. Detection and identification of pathogens
   b. Mycotoxins
   c. Quantitative PCR (qPCR) principles of analysis
   d. Sample preparation
   e. Chemical analysis
   f. Knowledge check

VII. Module 7: Residual Solvents
   a. What is the problem?
   b. Sample collection/preparation
   c. Headspace analysis
   d. Solid-phase micro extraction (SPME)
   e. GC/FID vs. GC/MS
   f. Knowledge check

VIII. Module 8: Heavy Metals
   a. Sources of heavy metal elements
   b. Bioaccumulation by cannabis plants
   c. Sample preparation
   d. Inductively coupled plasma/mass spectrometry (ICP/MS)
   e. Importance of isotopes
   f. Knowledge check