

Forensic Toxicology Instrumentation Techniques & Applications - Schedule

Date	Topic		Lecturer
January 14, 2019	Introduction to toxicology	Overview of toxicology Applications, basic concepts: internal standards, calibration quality control. Introduction into regulation	Barry Logan PhD
January 21, 2019	Introduction and Analytical science introduction-I	Introduction into the course. Functional group chemistry review. Introduction into chromatography and mass spectrometry.	Fran Diamond BS
January 28, 2019	Sample Preparation I General chromatography principles	Sample preparation introduction Solubility, solvent emulsions, acid/base chemistry, partition coefficients, Liquid/liquid extraction, heterogeneity, dilution, headspace sampling for volatiles.	Fran Diamond BS
February 4, 2019	Screening	Immunoassay: homogeneous, heterogeneous, quality control, multiplexing	Jill Yeakel MSFS
February 11, 2019	Gas Chromatography and GC/MS	Theory of gas chromatography Column parameters Detectors Sample introduction Introduction to mass spectrometry Data acquisition and fundamental data analysis Introduction to quantitative analysis. GC stationary phases	Sarah Keeling MSFS Fran Diamond BS
February 18, 2019	No lecture – AAFS annual meeting	EXAM February 13 and due February 27, 2017	No lecture
February 25, 2019	Forensic post-mortem toxicology	Postmortem toxicology vs. other forensic toxicology Case history evaluation Matrix and container types Screen vs. confirmation testing in practice Postmortem changes Case examples	Laura Labay PhD

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March 4, 2019	GCMS II	Tuning and calibration Gas chromatography maintenance and troubleshooting Deconvolution reporting software critical data review, peak shape, resolution, Qualitative analysis, Signal-to-noise	Sarah Keeling MSFS Fran Diamond BS
March 11, 2019	GCMS III	Derivatization GCMS mass spectral interpretation, Qualitative analysis, additional techniques MS/MS, etc.	Fran Diamond BS
March 18, 2019	Case processing and review	Document and data review Interpretation of results Forming an opinion Breakout groups: case assignment, propose testing and respond to questions about interpretation.	Laura Labay PhD
March 25, 2019	HPLC	Electromagnetic radiation Instrument operation and anatomy, isocratic, gradient, factors influencing separation, column selection, sample introduction, instrument maintenance, UPLC	Sarah Keeling MSFS Sue Neith BS
April 1, 2019	Exam no lecture		
April 8, 2019	LCMS I and sample preparation II	Single Quadrupole, Triple Quadrupole, method development, troubleshooting. Quantitative analysis Solid phase extraction	Fran Diamond BS
April 15, 2019	LCMSII and ICPMS	Time of Flight, ion trap mass spectrometry, Qualitative analysis. Instrumentation review ICPMS	Fran Diamond BS
April 22, 2019	Quality Assurance	Interfering Substances, Validation case study and data review, validation (LOQ, LOD, Precision, Accuracy, Stability) Corrective and preventative actions, Accreditation.	Rob Middleberg PhD
April 26, 2019	Cumulative Final Exam		