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| 课程代码（Coursenumber） Chemistry 3020 (302)  课程对象（Audience） Primarily for Undergraduates  开课教师（Teacher） Professor Petersen  学期（Semester） Fall  课程描述（Description）） Polarized Light Microscopy (Parts 1 and 2) Optical microscopy will be used as a tool for the presumptive identification of a wide variety of samples including fibers, inorganic crystalline solids, and organic explosives. An instructor lead workshop format will be used to provide training on sample preparation, use of crystal optics, photomicrography, and fusion methods to detect polymorphism. The final day in each part will be a lab practical. Multicomponent Analysis by UV-Vis Spectroscopy Training on the Agilent 8483 spectrometers will be done in a workshop format where samples of tea will be analyzed for their caffeine and theophylline content. The remaining five days will be devoted to the analysis of a universal indicator solution. This analysis will use optical spectroscopy to determine the concentrations of a five-component mixture of pH indicators. Control of pH, deviations to Beer’s Law, ionic strength, and preparation of useful standards will be examined in designing a method for the analysis. Major emphasis of the experiment is aimed at error analysis using Excel as a tool for identifying strengths and weaknesses in the experimental design. Qualitative and Quantitative Analysis by FTIR Sampling methods and choice of operating parameters will be examined in the qualitative analysis of a variety of polymers and drugs. Search libraries and functional group analyses will be used as an aid to the identification of unknowns. Instrumental design, IR optics, and spectral processing will be examined. The quantitative analysis of a commercial mixture of xylenes will be used to illustrate methods of analysis in a region where Beer’s law deviations are extreme. Quantitative Analysis by Gas Chromatography and GCMS The theory of vapor/liquid chromatography will be examined and applied to optimizing the operating conditions for the analysis of a selection of commercial samples. Both packed and capillary column instruments will be used in the lab exercises. A strengths and weaknesses of a selection of detector types (thermal, flame ionization, and mass spect.) will be explored during the course of the analyses.  课程提纲（Syllabus） Laboratory Schedule week starting: Monday/Tuesday lab Wednesday/Thursday lab August 31 Check-in/Excel Tutorial Microscopy (1: fibers) September 7 Microscope (1: fibers) Microscopy (1: fibers) September 14 Caffeine in Tea Universal Indicator September 21 Universal Indicator Universal Indicator September 28 Universal Indicator Universal Indicator October 5 Microscopy (2: crystals) Microscopy (2: crystals) October 12 \*\*\*Fall Break\*\*\* Microscopy (2: crystals) October 19 FTIR (1: Quantitative) FTIR (1: Quantitative) October 26 FTIR (1: Quantitative) FTIR (2: Qualitative) November 2 FTIR (2: Qualitative) FTIR (2: Qualitative) November 9 Gas Chromatography Gas Chromatography November 16 Gas Chromatography GC/Mass Spectroscopy November 23 GC/Mass Spectroscopy \*\*\*Thanksgiving Break\*\*\* November 30 GC/Mass Spectroscopy Check out  课时信息（Totalhours）  教参信息（Textbookinfo） Forensic Chemistry (ISBN - 9780131478350) |