Archaeological and Forensic Chemistry

Lecturer: Dr hab. Magdalena Śliwka-Kaszyńska (WCh)

Monographic lectures for PhD students (15 hrs)

1. General Introduction

General overview of how science helps to unravel human history, early investigations, the growth of scientific archaeology in the 20th century, current status and scope of archaeological chemistry, the type of archaeological materials.

2-4. Analytical techniques applied to archaeological materials

Magnification: Optical microscopes, Scanning Electron microscope;

Elemental Analysis: infrared spectroscopy, infrared reflectography, X-Ray Fluorescence Spectroscopy, Raman spectroscopy, Inductively Coupled Plasma-Optical Emission Spectrometer, CN Analyzer, Neutron Activation Analysis;

Isotopic Analyses: Oxygen, Carbon, Nitrogen and Strontium isotopes, mass spectrometric techniques;

Organic Analysis: Methods of Organic Analysis, Gas/Liquid Chromatography–Mass Spectrometry;

Mineral and Inorganic Compounds: Petrography, X-Ray Diffraction, IR Spectroscopy.

5-6. Pigments, Colors and binders: its significance and production

Classification and characterization of pigments, their chemical properties, origin and history, restoration, conservation, authentication, the palette of colors and painting techniques according to the art eras.

Practical examples: The Hitler diaries, color production in Ancient Egypt

7. Art under scrutiny, scientific detection of forgery in paintings

Practical examples: The Van Meegeren Forgery; Total analysis of Memling's Gdansk "Last Judgment"

8-9. Dating techniques incorporated in some case studies

Radiocarbon dating, fluorine dating, racemization of amino acids, thermoluminescence dating, Potassium Argon dating

Practical examples: The Piltdown Fraud; The Shroud of Turin

10. Mummification

The chemical procedure of mummification in Ancient Egypt.

Projekt „Rozwój interdyscyplinarnych studiów doktoranckich na Politechnice Gdańskiej w zakresie nowoczesnych technologii" jest współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego.

11. The Origins of Forensic Science

The Early Years of Forensic Science, Sir Arthur Conan Doyle, Advances in the 20th Century, The Scope of Forensic Chemistry

12. Fingerprinting

The History of Fingerprinting, Sir Edward Henry, General Principles of Fingerprinting, Fingerprinting Systems, Fingerprint Detection, Powder Tests, Chemical Tests, Light Tests

13. Forensic Serology

Blood Types, Mathieu Joseph Bonaventure Orfila, Polymorphic Proteins and Isoenzymes

Philip Levine, Characterization of Bloodstains, Bloodstain Patterns,Testing for Semen and Saliva

14. Toxicology and Drug Testing

Alcohol and the Human Body, American Academy of Forensic Sciences, Testing for Blood Alcohol Concentration, Robert Borkenstein, Testing for Drugs, Testing for Poisons

Confirmatory Tests

15. Arson and Explosives Investigation

Arson as an Economic and Social Problem, Arson Investigations, Paul Leland Kirk

Explosives Investigations, Richard G. Livesay

Data	Dzień tygodnia	Godzina	Sala
2012-12-07	Piątek	17-19	LUWR (Chemia A)
2012-12-14	Piątek	17-19	LUWR (Chemia A)
2012-12-18	Wtorek	17-19	LUWR (Chemia A)
2013-01-04	Piątek	17-19	LUWR (Chemia A)
2013-01-11	Piątek	17-19	LUWR (Chemia A)
2013-01-18	Piątek	17-19	LUWR (Chemia A)
2013-01-25	Piątek	17-20	LUWR (Chemia A)