ERASMUS+  PROJECT

ICT Networking for Overcoming Technical and Social Barriers in Instrumental Analytical Chemistry Education

UNIVERSITY OF TIRANA, ALBANIA
NETCHEM-Patner

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- Introduction - Foundation of University of Tirana
- International recognition of University of Tirana
- NETCHEM-related teaching activities
- NETCHEM-related research in Environmental protection
- NETCHEM-related research in Food Safety Control
INTRODUCTION
Foundation of University of Tirana

University of Tirana (UT), was founded in 1957 by Albanian Government as the State University of Tirana through the merging of five existing institutes of higher education, (pedagogical institute, polytechnic, economic, medical, legal and science institute), the most important of which was the Institute of Sciences, founded in 1947.

In 1967 the University received its full form with the construction of its first campus giving the university a greater dimension.

In 1991, during the transition period the Engineering Faculties were broken from the State University of Tirana creating the Polytechnic University of Tirana and the State University was changed the name to University of Tirana as it is known today.

University of Tirana (UT) is the oldest public University in Albania and it is an education and research institution offering 180 study programs in 6 faculties (Natural Sciences, Economics, Law, History and Philology, Social Sciences and Foreign Languages) with more than 40,000 students and 1100 academic staff. UT offers three-year Bachelor, one- or two-year Master, and three- to five-year doctorate degree programs, in accordance with the Bologna system.
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INTRODUCTION

International recognition of University of Tirana

Actually UT is involved in several cooperation programs of the European Commission: Tempus, Erasmus Mundus Action 2, IPA specifically in JoinEU-SEE, Basileus, Pacinno, Eureqa, Tempus Interface.

All structures of UT students, academic and administrative staff have been involved in mobility projects such as Basileus, COST and JoinEU-SEE.

UT is partner in many cooperation agreements with various European universities and institutions. In the framework of these agreements exchanges of academic staff and students, joint research programs, exchange of academic publications, magazines, organization of various conferences etc. are organized.

UT is also partner of many international networks such as UNICA, UNIMED, CMU etc.

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The Faculty of Natural Sciences has 8 departments and is the main centre in Albania for training specialists and researchers in the fields of mathematics, computer sciences, physics, chemistry, biology and biotechnology.

Department involved in the NETCHEM project:

- Department of Chemistry
- Department of Industrial Chemistry
- Department of Informatics
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NETCHEM-related teaching activities

Knowledge on Environmental protection and Food Safety Control are introduced in the curricula of several Bachelor and Master Programs.

**Bachelor Programs:**
- Analytical Chemistry
- Instrumental methods of analyses (optical methods, electrochemical methods and Cromatography)
- Food Chemistry and Food Technology
- Food Microbiology
- Pollution in Food Industries
- Nutrition, Food Systems and Food Equilibra
- etc

**Master programs:**
- Environmental Chemistry (is included in several curriculas)
- AAS, Electrochemical Sensor and biosensors,
- QA&QC of analytical results
- Fermentation Technologies
- Food Safety and Food Quality
- Food Safety- ISO and HACCP
- Technologies of Conservation and Preservation of Food Products
- Packaging Systems of Food Products
- Accreditation of the Labs of Food Analysis
- etc

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NETCHEM-related teaching activities in Computers Science and Analytical Chemistry

Master programs:

**Architecture Application Enterprise** (Master of Science in Informatics): One of the goals of this subjects is teaching the architecture and application of a distributed system in different domains. New tools and sensors can be combined to sense different environmental and food security parameters as detecting heavy metals and their chemical level in water, report that information and trigger an human or automatic response to an environmental threat. Sensor network system distributed in the environment can be used to collect the data and get real time information. Other applications can be built on top of distributed systems like a web site information site or mobile application.

**Technologies of Cloud Computing** (Master of Science in Information Technology): Cloud computing where both software and computer files reside online, offers a solution to the data management produced by many researchers or different sensors.

**Data Mining** (Master of Science in Informatics): After gathering the data different data mining techniques and algorithms can be applied to discover hidden relationship between the attributes.

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Department of Chemistry is the first analytical group that has been involved in the evaluation of the environmental situation in Albania.

- Optical and electrochemical methods (environmental application);
- Developing electrochemical sensors and biosensors based on surface modifications or composite materials;
- Surface treatment of natural products to produce valuable porous, large surface materials (improvement of the adsorptive and catalytic properties)

**Techniques:** AAS (flame/GF), UV-VIS Spectrometry, GC-MS (?), Electrochemistry,

**Infrastructure:** Laboratory of Environmental Chemistry (determination of nutrients)
- Laboratory of SAA (HM determination)
- Laboratory of GC-MS
- Laboratory of electrochemical analyses (application of sensors and biosensors)

QA&QC plan is applicable based on reference materials, and participation in Intercalibration exercises!
NETCHEM-related research in Food Safety Control

Food safety topics are involved in the teaching and research work of the Department of Industrial Chemistry:

- Microbiological evaluation of food products.
- Discovery of endemic microorganisms and microbial pollulants,
- Taxonomic studies of bacteria, yeasts and moulds are performed in this laboratory.
- Classical and standard analysis of food products (routine analysis with students and PhD),
- Physical and chemical analysis of oils, cereals, biscuits, meat, milk products, beer, wine, etc.

Techniques: Spectrophotometry, refractometry, polarimetry, distillatory equipments, etc.

Infrastructure: Laboratory of Microbiology
Laboratory of Food Analysis

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Thank you!