Module Title:
Please provide a module title which should have only 30 characters including punctuation and spaces .
Water. Sampling and general characteristics

Module Code:
Please code according to the code QM-xx-xx, AM-xx-xx or DA-xx-xx
AM0102

Maximum Number of Students:
Please include any limitation on the number of students able to take the module.
24 students

Total ECTS Credits
This should be the sum of the credits for each of the semesters in which the module is to run.
2

Notional Learning Hours
(a) Contact Time - 15_____h
(b) Private Study - 5___ h

Format of Teaching:
Lectures 9_____h
Laboratories or Practicals _____h
Other 6 ____h

Teaching Strategy:
Please show how the contact hours are to be allocated in terms of the type of class involved.
Lectures will cover criteria of water quality classification and strategy, techniques and devices of water sampling
Each student prepares a short PP presentation based on the paper selected in scientific journal and accepted by the teacher

Convener:
The name of the member of permanent staff responsible for the module.
Professor Bogdan Zygmunt, PhD, DSc or Professor Waldemar Wardencki, PhD, DSc

University / Department:
The name of the University and Department responsible for the module.
Gdansk University of Technology, The Chemical Faculty, Department of Analytical Chemistry

Language of Tuition:
Please state whether module is to be taught through the medium of English or another language. If bi-lingual please indicate % of each language
English

Module Description - The Purpose or Aims:
This should specify the purpose of the module where it fits into the programme specification and what it aims to provide. Please list the Aims in numerical order.
1. To show the importance of scientifically reliable and legally defensible data to the students
2. To provide the students with the strategy of water sampling (where, when, how often and how many samples should be taken to get information representative for the population studied)
3. To provide skills s of selection of techniques and devices to sample different waters

Specific Learning Outcomes for this module: (contributing to general learning outcomes GLO 1 – GLO 10)
Learning Outcomes should provide statements which articulate what the student has achieved upon completion of the course. What will a student know, understand or be able to do?

The student will learn the importance of sampling for obtaining reliable and meaningful analytical results. Sammpling strategy, techniques and devices for water sampling will be taught, especially to make the students capable to evaluate if sampling for a given purpose was properly planned and executed. (GLO3, 4, 6).

Summary of Course Content:
This should be a summary paragraph of list of the topics to be covered by the module.
1. classification of ground and surface waters with respect to their quality
2. presentation of quality criteria;
3. general comments on sampling importance
4. types of samples;
5. strategy of sampling (where, when, what, how, and how many samples)
6. approaches in environmental sampling
7. general guidelines of techniques
8. techniques and corresponding devices of collection of ground and surface water
9. advantages and disadvantages of manual and automated sampling
10. future trends in sampling

Transferable Skills Taught:
Please list in numerical order the key skills taught e.g. communication, information technology, interpersonal skills, teaching/study skills. Please relate these to benchmark statements.
The module should contribute to enhance students' communication and study skills.

Assessment Methods:

Details of assessment methods should include forms of assessment and the contribution of each to the summative assessment of the module. The relationship to the learning outcomes of the module should be explicit and the numbers of the various learning outcomes should be attached to the assessment methods listed. Please list in numerical order

The student will be assessed on the basis of presentation prepared (quality of slides, material selected, way of presentation and answer to question related to the topic presented) and a short written exam

Assessment Criteria:

Details of assessment methods should include forms of assessment and the contribution of each to the summative assessment of the module. The relationship to the learning outcomes of the module should be explicit and the numbers of the various learning outcomes should be attached to the assessment methods listed. Please list in numerical order.

Treshold: Achieving 50% score at the closed written exam and acceptable presentation

Good: Minor errors in the closed written exam and good presentation with correct answers to teachers questions

Excellent: Almost perfect closed written exam and excellent presentation with correct answers to students and teachers questions and asking a reasonable question/s concerning some other presentations

Resource Implications of Proposal and Proposed Solutions:

Details on any resources required and should be included. Please also list e.g core texts; recommended reading material; equipment; films etc.

Keith, L.H., Principles of Environmental Sampling, Second Edition, Chapter 13: Automatic Water and Wastewater Sampling, American Chemical Society, Washington, 1996.
Liess, M. and Schulz, R., in: Nollet, L.M.L., Editor, Handbook of Water Analysis, Chapter 1: Sampling Methods in Surface Waters, Marcel Dekker, New York, 2000.
Wardencki, W. and Namiesnik, J., in: Pawliszyn, J, Editor, Sampling and sample preparation for field and laboratory. Fundamentals and new directions in sample preparation, Chapter 2: Sampling water and aqueous solutions, Elsevier, Amsterdam, 2002.
Madrid, Y. and Zayas, Z.P., Water sampling: Traditional methods and new approaches in water sampling strategy, *Trends Anal. Chem.,* 26, 4, 2007.
Hildebrandt, A., Lacorte, S. and Barcelo, D., Sampling of water, soil and sediment to trace organic pollutants at a river-basin scale, *Anal. Bioanal. Chem.*, 386, 1075, 2006.
Zhang Chunlong, Fundamentals of environmental sampling and analysis, John Wiley and Sons, Hoboken, New Jersey, 2007
Copy of PP lectures

Pre-Requisites:

Any module(s) which must have been taken prior to the current module, or any specific background required to take this module.

Basics of Analytical Chemistry
AM101Water Directive and CN standards