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| **Study program** Applied chemistry with the management basics |
| **Course title** Quality management in laboratory (H258C) |
| **Name of lecturer/lecturers** Ivana D. Rašić Mišić |
| **Type of course** obligatory |
| **Number of ECTS allocated** 4 |
| **Course objectives**Acquiring basic knowledge in the field of quality control, developing the ability to introduce and monitor quality systems in a chemical laboratory, as well as to acquire knowledge of methodology validation and laboratory accreditation. Understanding the importance of quality assurance and control in the laboratory. |
| **Course outcomes**Upon successful completion of this course, the student will be able to:* define and explain the scientific principles on which quality control is based in industrial, health and research laboratories;
* analyze the obtained measurement results;
* do their statistical processing and use them for quality assessment;
* explain the purpose of meeting the required standards and harmonizing the need and demand;
* apply and implement quality control of the analytical system starting from sampling, method introduction up to validation of new method;
* defines basic laboratory accreditation procedures.
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| **SYLLABUS***Lectures*Systematic approach to chemical analysis. Analytical system. Analytical signal. Analytical result and analytical information. Analytical system errors. Statistical processing and evaluation of experimental results. Quality system. Quality management. Quality assurance in the analytical laboratory. Principles of quality assurance of measurement data. Quality control. Validation. Sample validation and sampling. Method validation. Data validation. Quality assessment. Internal and external quality control. Control charts (Shewhart chart). Reference materials. Accreditation of the laboratory. Sample and sampling. Sampling quality assurance. Sample size. Calibration procedures. Interferences. Calibration diagrams. The standard addition method. The internal standard method. Characteristics of analytical methods and criteria for choosing the appropriate method. Development and validation of analytical methods. Selectivity and specificity of the method. Sensitivity, limit of detection and limit of quantification. Working range. Accuracy and precision of determination. Repeatability of results.*Laboratory work*Determining the sensitivity of the method. Determination of the limit of detection and the limit of quantification of the method. Determination of the working area of the method. Determination of analyte content by standard addition method. Determination of accuracy and reproducibility of the method. Writing the plan for the introduction of the new or existing methods and its practical implementation. |
| **References**1. Kaštelan-Macan, Kemijska analiza u sustavu kvaliteta, Školska knjiga, Zagreb, 2003.
2. D.A. Skoog, D. M. West, F.J. Holer, Foundamentals of Analytical Chemistry, Sounders College Publishing, New York, 1996.
3. Funk, Werner; Dammann, Vera; Donnevert, Gerhild, Quality assurance in analytical chemistry: applications in environmental, food, and materials analysis, biotechnology, and medical engineering, Wiley-VCH Verlag 2007
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| **Active teaching classes** | **Lectures** 30 | **Laboratory work** 30 |
| **Teaching mode**lectures, interactive teaching, laboratory exercises, computational exercises, seminar, consultation |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** |
| **Pre exam duties** | **Points** | **Final exam**  | **Points** |
| Activity during lectures | 10 | Written examination | 10 |
| Practical teaching | 20 | Oral examination | 30 |
| Teaching colloquia | 20 |  |  |
| Seminar | 10 |  |  |