1. **Title of module**: **Physical and chemical methods**
2. **Module** **code:** ХЕ\_6\_3.1.29\_3
3. **Module Type**: required
4. **Semester**: 5
5. **The volume of the module**: total number of academic hours – 90 (ECTS credits – 3); class hours – 26 (lectures – 10, laboratory classes – 16).
6. **Speaker**: Sergei N. Galushko – candidate of chemical sciences.
7. **Learning Outcomes**: After studying the course students *should*:
 **Know:** the rules of technology in the analytical laboratory, sample preparation basis, the foundation of photometric, atomic absorption, flame-photometric, potentiometry, voltamperometry, coulometry methods of analysis, the foundation of statistical processing of results of analysis.

**Be able to:** use chemical vessels, conduct sample concentration by evaporation, measurements of fotoelektrocoulometry; ionmetry, pH meters, to solve computational problems: the calculation of concentration, using the Nernst equation to calculate the potential of the electrode, the EMF of the cell, law Buher-Lambert-Ber of optical density, molar ratio of light-absorbtion, cell thickness and concentration of the solution, calculate the retention characteristics in chromatography, conduct statistical analysis of treatment results.

1. **Method of training:** classroom.
2. **Required previous and related modules:** general chemistry, analytical chemistry.
3. **Content of the module**: sample preparation and statistical processing of results of analysis, electrochemical methods of analysis, spectroscopic and chromatographic methods of analysis.
4. **Recommended literatures**:

1. Васильев В.П., Аналитическая химия. — Ч. 2. Физико-химические методы анализа. — М., 1989;

2. Дорохова Е.Н., Прохорова Г.В. Аналитическая химия. Физико-химические методы анализа. — М., 1991;

3. Золотов Ю.А. Аналитическая химия: проблемы и достижения. — М., 1992;

4. Пилипенко А.Т., Пятницкий И.В. Аналитическая химия. — М., 1990;

5. Физико-химические методы анализа / Под ред. В.Б. Алесковского. — Л., 1988.

6. Ляликов Ю.Г. Физико-химические методы анализа. - М.: Химия, 1974 г.

7. Практикум по физико-химическим методам анализа. Под ред. Петрухина О.Н. - М.: 1987г.

8. Набиванець Б.І., Сухан В.В. Аналітична хімія природнього середовища. – Київ: Либідь, 1996 г.

1. **The forms and methods of teaching**: lectures, laboratory exercises, self-study.
2. **Methods and criteria for estimation:**

Current control (70%) – reports of practical works, reference works.

Closing control (30%) – test.

1. **Language**: Ukrainian