1. **Title of the module:** **Structure of Matter**
2. **Code module:** ХЕ \_6\_3.1.23\_3
3. **Module Type:** selective
4. **Semester:** 2
5. **The volume of the module**: the total number of hours - 90, including lectures - 20 hour, practice exercises - 22 hours, the number of ECTS credits - 3.
6. **Speaker:** Sergei N. Galushko – candidate of chemical sciences
7. **Learning outcomes**: After completing this course students *should*:
Show the relationship between the molecular structure of substances and their basic physical and chemical properties. Characterize the properties of matter in terms of atomic-molecular theory, which is based on the laws of quantum mechanics and thermodynamics
* To establish the relationship between molecular structure of matter and its spectra in various ranges of the scale of electromagnetic waves;
* - To establish the relationship between the microscopic and macroscopic properties of matter;
* - To show the role of intermolecular interactions in the formation of solid and liquid states of matter.
1. **Method of training**: classroom.
2. **Required previous and related modules**: general chemistry, inorganic chemistry.
3. **The content of the training module:** Classical and quantum model of the structure of matter. The geometry of the molecules. Structural aspects of the formation of chemical bonds. Types of chemical bonds. The role of intermolecular interactions in the process of structuring of solids and liquids.
4. **Recommended literatures**:

1. Татевский В.М. Строение молекул. М.: Химия, 1977. - 511 с.

2. Минкин В.И., Симкин Б.Я., Миняев P.M. Теория строения молекул: Учеб.пособие. М.: Высш.шк., 1979. - 407 с.

3. Жданов Ю.А. Теория строения органических соединений: Учеб.пособие. М.: Высш.шк., 1971.-286 с.

4. Картмелл Э., Фоулс Г.В.А. Валентность и строение молекул. М.: Химия, 1979. -360 с.

5. Карапетьянц М.Х., Дракин СИ. Строение вещества. М.: Высш.шк., 1970 . - 312 с.

6. Пиментел Г., Спратли Р. Как квантовая механика объясняет химическую связь. М.: Мир, 1973.-331 с.

7. Терешин Г.С. Химическая связь и строение вещества. М.: Просвещение, 1980.-176 с.

8. Красовицкая Т.П. Електронные структуры атомов и химическая связь. М.: Просвещение, 1972. - 223 с.

9. Бейдер А. Основные представления современной физики. М.: Атомиздат, 1973.-548 с.

10. Шусторович Е.М. Химическая связь. М.: Наука, 1973. - 230 с.

11. Эрдеи-Груз Т. Основы строения материи. М.: Мир, 1976. - 488 с.

12. Дмитриев И.С. Симметрия в мире молекул. М.: Химия, 1976. - 128 с.

13. К.Хаускрофт, Э.Констебл. Современный курс общей химии, т.1-2, М.: Мир, 2002.-540 с.

**12. The forms and methods of teaching:** lectures, practical exercises ,self-study.

**13. Methods and criteria for estimation**:

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

 Closing control (30%) – test, reference work

**14. Language**: Ukrainian