**Master program Analytical chemistry**

**List of the components of the educational program**

**Specailization: Analytical Chemistry**

**Semester 1**

|  |  |  |  |
| --- | --- | --- | --- |
| № | Course  | Credits | Hours |
| **Mandatory academic disciplines** |
| 1 | Methodology and organization of scientific research with the basics of intellectual property | 3 | 90 |
| 2 | Professional and corporate ethics | 3 | 90 |
| 3 | Methodology of teaching chemistry in higher educational institutions | 3 | 90 |
| 4 | Supramolecular chemistry | 5 | 150 |
| 5 | Higher school pedagogy and pedagogical skills of a teacher | 3 | 90 |
| 6 | Methods of determining the structure of chemical compounds and materials  | 3 | 90 |
| 7 | Chemical aspects of life  | 4 | 120 |
| 8 | Statistic and combinatorial methods in chemistry | 4 | 120 |
|  | **Total** | **28** | **840** |

**Semester 2**

|  |  |  |  |
| --- | --- | --- | --- |
| № | Course  | Credits | Hours |
| **Mandatory academic disciplines** |
| 1 | Psychology of high school | 3 | 90 |
| 2 | Methods of determining the structure of chemical compounds and materials  | 6 | 180 |
| 3 | Research practice without separation from theoretical training | 5 | 150 |
| 4 | Chemical aspects of the development of new materials | 3 | 90 |
| **Disciplines of free choice of the student (Analytical Chemistry)** |
| 5 | Environmental Analytical Chemistry | 4 | 120 |
| 6 | Investigation of the complex formation by modern techniques | 5 | 150 |
| 7 | Microanalytical systems and sensors | 3 | 90 |
| 8 | Modern methods of sample preparation | 3 | 90 |
|  | **Total** | **32** | **960** |

**Semester 3**

|  |  |  |  |
| --- | --- | --- | --- |
| № | Course  | Credits | Hours |
| **Mandatory academic disciplines** |
| 1 | Nanochemistry and nanotechnology | 3 | 90 |
|  | Functional nanomaterials | 3 | 90 |
|  | Chemical aspects of creating new materials  | 3 | 90 |
| 2 | Assistant (teaching) practice | 7 | 210 |
| **Disciplines of free choice of the student (Analytical Chemistry)** |
| 3 | Kinetic and enzymatic methods and analysis | 3 | 90 |
| 4 | Bioanalytical chemistry | 4 | 120 |
| 5 | Pharmaceutical analysis | 3 | 90 |
| 6 | Modern methods of chromatography | 5 | 150 |
|  | **Total** | **31** | **930** |

**Semester 4**

|  |  |  |  |
| --- | --- | --- | --- |
| № | Course  | Credits | Hours |
| **Mandatory academic disciplines** |
| 1 | Рresentation of research results | 4 | 120 |
| 2 | Pre-diploma practice | 7 | 210 |
| 3 | Master's thesis | 18 | 540 |
|  | **Total** | **29** | **870** |

**Specailization: Chemical Analysis and Management of the Analytical Laboratory**

**Semester 1**

|  |  |  |  |
| --- | --- | --- | --- |
| № | Course  | Credits | Hours |
| **Mandatory academic disciplines** |
| 1 | Methodology and organization of scientific research with the basics of intellectual property | 3 | 90 |
| 2 | Professional and corporate ethics | 3 | 90 |
| 3 | Methodology of teaching chemistry in higher educational institutions | 3 | 90 |
| 4 | Supramolecular chemistry | 5 | 150 |
| 5 | Higher school pedagogy and pedagogical skills of a teacher | 3 | 90 |
| 6 | Methods of determining the structure of chemical compounds and materials  | 3 | 90 |
| 7 | Chemical aspects of life  | 4 | 120 |
| 8 | Statistic and combinatorial methods in chemistry | 4 | 120 |
|  | **Total** | **28** | **840** |

**Semester 2**

|  |  |  |  |
| --- | --- | --- | --- |
| № | Course  | Credits | Hours |
| **Mandatory academic disciplines** |
| 1 | Psychology of high school | 3 | 90 |
| 2 | Methods of determining the structure of chemical compounds and materials  | 6 | 180 |
| 3 | Research practice without separation from theoretical training | 5 | 150 |
| 4 | Chemical aspects of the development of new materials | 3 | 90 |
| **Disciplines of free choice of the student (Chemical Analysis and Management of the Analytical Laboratory)** |
| 5 | Quality control of pharmaceutical products | 3 | 90 |
| 6 | Quality control of food products | 4 | 120 |
| 7 | Highly effective liquid chromatography | 5 | 150 |
| 8 | Quality management analysis | 3 | 90 |
|  | **Total** | **32** | **960** |

**Semester 3**

|  |  |  |  |
| --- | --- | --- | --- |
| № | Course  | Credits | Hours |
| **Mandatory academic disciplines** |
| 1 | Nanochemistry and nanotechnology | 3 | 90 |
| 2 | Functional nanomaterials | 3 | 90 |
| 3 | Chemical aspects of creating new materials  | 3 | 90 |
| 4 | Assistant (teaching) practice | 7 | 210 |
| **Disciplines of free choice of the student (Chemical Analysis and Management of the Analytical Laboratory)** |
| 3 | Analytical chemistry of eco- and biotoxicants | 6 | 180 |
| 4 | Capillary gas chromatography and capillary electrophoresis | 3 | 90 |
| 5 | Development and validation of analysis methods | 3 | 90 |
| 6 | Analysis of drugs | 3 | 90 |
|  | **Total** | **31** | **930** |

**Semester 4**

|  |  |  |  |
| --- | --- | --- | --- |
| № | Course  | Credits | Hours |
| **Mandatory academic disciplines** |
| 1 | Рresentation of research results | 4 | 120 |
| 2 | Pre-diploma practice | 7 | 210 |
| 3 | Master's thesis | 18 | 540 |
|  | **Total** | **29** | **870** |