

**AMENDMENTS AND CHANGES TO THE CURRICULUM IN THE EDUCATIONAL DISCIPLINE  
«RADIATION MEDICINE AND ECOLOGY»**  
for the specialty 7-07-0911-01 «General Medicine»  
for 2025/2026 academic year

| Amendments and changes                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Use in the educational process as the basic (main) literature:<br>1. Radiation medicine : textbook for foreign students of higher education institutions in medical specialties / A. N. Stozharov [et al.]; edited by A. N. Stozharov. – Minsk: Novoe znanie, 2020. – 205 p.                                                                                                                                                                                | Department meeting (protocol # 9 of 12 March 2025) |
| Changes have been introduced into the Thematic Plan and into the Educational Discipline Curricular Chart (attachment #1 and #2)                                                                                                                                                                                                                                                                                                                             | Department meeting (protocol # 9 of 12 March 2025) |
| Form of practical skills control for practical skills «6. Assessment of the level of pollution in the atmospheric air», «8. Assessment of the level of pollution in drinking water», «11. Assessment of the electromagnetic environment in the room», «14. Evaluation of the ambient dose equivalent rate of roentgen and gamma radiation» and «17. Measurement of an individual equivalent dose» add the words «checking laboratory measurement protocols» | Department meeting (protocol # 9 of 12 March 2025) |

The curriculum is revised and approved at the department meeting of the department of Radiation Medicine and Ecology (protocol # 9 of 12 March 2025)

Head of the department  
of Radiation Medicine and Ecology



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APPROVED

Dean of the Medical Faculty for International Students



O.S. Ishutin

## THEMATIC PLAN

| Section (topic) name                                                                     | Number of class hours       |            |
|------------------------------------------------------------------------------------------|-----------------------------|------------|
|                                                                                          | lectures<br>(incl.<br>SSIW) | laboratory |
| <b>1. Ecological Medicine</b>                                                            | <b>9</b>                    | <b>34</b>  |
| 1.1. Fundamentals of environmental medicine. Environmental factors                       | 1,5                         | 2          |
| 1.2. Effect of physical factors on the human body and health                             |                             | 6          |
| 1.3. Effect of chemical factors on the human body and health                             | 1,5                         | 2          |
| 1.4. Effect of biological factors on the human body and health                           |                             | 2          |
| 1.5. Heredity and environment                                                            |                             | 2          |
| 1.6. Environmental and medical consequences of air pollution                             | 1,5                         | 4          |
| 1.7. Environmental and medical consequences of hydrosphere pollution                     |                             | 4          |
| 1.8. Effect of the state of the lithosphere and the quality of food on population health | 1,5                         | 4          |
| 1.9. Medical aspects of the influence of the indoor environment on human health          | 1,5                         | 4          |
| 1.10. Monitoring the environment and public health                                       | 1,5                         | 2          |
| 1.11. Regulatory legal framework for environmental protection                            |                             | 2          |
| <b>2. Radiation Medicine</b>                                                             | <b>12</b>                   | <b>34</b>  |
| 2.1. Effects of ionizing radiation                                                       | 3                           | 6          |
| 2.2. Public exposure of humans. Background radiation levels                              | 1,5                         | 4          |
| 2.3. Chernobyl Accident                                                                  |                             | 4          |
| 2.4. Biomedical consequences of irradiation. Radiosensitivity                            | 1,5                         | 2          |
| 2.5. Deterministic and stochastic effects of radiation                                   | 1,5                         | 4          |
| 2.6. Radiation injuries to humans                                                        | 1,5                         | 4          |
| 2.7. Radiation safety                                                                    | 1,5                         | 4          |
| 2.8. Reduction in radiation burden on population                                         | 1,5                         | 6          |
| <b>Total hours</b>                                                                       | <b>21</b>                   | <b>68</b>  |

## ACADEMIC DISCIPLINE CURRICULAR CHART

| Section, topic # | Section (topic) name                                                                                                                         | Number of hours |            | Supervised student independent work | Literature | Practical skills | Form of control     |                                                       |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|-------------------------------------|------------|------------------|---------------------|-------------------------------------------------------|
|                  |                                                                                                                                              | lectures        | laboratory |                                     |            |                  | of practical skills | of current / intermediate assessment                  |
|                  | <b>4th semester</b>                                                                                                                          |                 |            |                                     |            |                  |                     |                                                       |
|                  | <b>Ecological Medicine</b>                                                                                                                   | <b>6</b>        | <b>-</b>   | <b>3</b>                            |            |                  |                     |                                                       |
| 1.1.             | Basics of environmental medicine. Environmental factors. Effect of physical factors on the human body and health                             | 1,5             | -          | -                                   | 8          |                  |                     |                                                       |
| 1.2.             |                                                                                                                                              |                 |            |                                     |            |                  |                     |                                                       |
| 1.3.-            | Effect of chemical factors on the human body and health. Effect of biological factors on the human body and health. Heredity and environment | -               | -          | 1,5                                 | 8          |                  |                     | Interviews, preparation and presentation of abstracts |
| 1.5.             |                                                                                                                                              |                 |            |                                     |            |                  |                     |                                                       |
| 1.6.             | Environmental and medical consequences of air pollution. Environmental and medical consequences of hydrosphere pollution                     | 1,5             | -          | -                                   | 8          |                  |                     |                                                       |
| 1.7.             |                                                                                                                                              |                 |            |                                     |            |                  |                     |                                                       |
| 1.8.             | Effect of the state of the lithosphere and the quality of food on population health                                                          | 1,5             | -          | -                                   | 8          |                  |                     |                                                       |
| 1.9.             | Medical aspects of the influence of the indoor environment on human health                                                                   | -               | -          | 1,5                                 | 8          |                  |                     | Interviews, preparation and presentation of abstracts |

|       |                                                                                                                                                                                                                                                |     |           |   |            |                                                                                                    |                               |                                                                          |
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| 1.10. | Monitoring the environment and public health. Regulatory legal framework for environmental protection                                                                                                                                          | 1,5 | -         | - | 8          |                                                                                                    |                               |                                                                          |
| 1.11. |                                                                                                                                                                                                                                                |     |           |   |            |                                                                                                    |                               |                                                                          |
|       | <b>Laboratory lessons</b>                                                                                                                                                                                                                      | -   | <b>34</b> | - |            |                                                                                                    |                               |                                                                          |
| 1.1.  | Fundamentals of environmental medicine. Environmental factors. Environmentally dependent morbidity of the population.<br>Lab.w.: «Human adaptation to environmental factors»                                                                   | -   | 2         | - | 2, 3, 4, 8 | Human adaptation to environmental factors                                                          | Account on laboratory work    | Express-interview, electronic tests, reporting and defense of the essays |
| 1.2.  | Environmental factors. Effect of physical factors on the human body and health: the influence of the visible region of the solar spectrum and illumination on the human body.<br>Lab.w.: Assessment of the risk of seasonal emotional disease» | -   | 2         | - | 4, 8       | Assessment of the risk of seasonal emotional disease                                               | Account on laboratory work    | Express-interview, electronic tests, reporting and defense of the essays |
| 1.2.  | Effect of physical factors on the human body and health: human health effect of ultraviolet radiation (UVR).<br>Lab.w.: «Evaluation of the type of skin sensitivity to UV radiation. Assessment of risk for skin malignancy»                   | -   | 2         | - | 4, 8       | Evaluation of the type of skin sensitivity to UV radiation. Assessment of risk for skin malignancy | Solving situational problems* | Express-interview, electronic tests, reporting and defense of the essays |
| 1.2.  | Effect of physical factors on the human body and health: Geomagnetic factors. Weather sensitivity.<br>Lab.w.: «Biological rhythms. Calculation of the daily rhythm of human temperature and pulse»                                             | -   | 2         | - | 4, 8       | Biological rhythms. Calculation of the daily rhythm of human temperature and pulse                 | Account on laboratory work    | Express-interview, electronic tests, reporting and defense of the essays |
| 1.3.  | Effect of chemical factors on the human body and health.<br>Lab.w.: «Epidemiological studies of the populations exposed to xenobiotics using the «case-control» method»                                                                        | -   | 2         | - | 4, 8       | Epidemiological studies of the populations exposed to xenobiotics                                  | Account on laboratory work    | Express-interview, electronic tests, reporting and defense of the essays |
| 1.4.  | Effect of biological factors on the human body and health                                                                                                                                                                                      | -   | 2         | - | 4, 8       |                                                                                                    |                               | Express-interview, reporting and defense of the essays                   |

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|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|------|-------------------------------------------------------------|------------------------------|---------------------------------------------------------------------------------------|
| 1.5. | Heredity and environment. The role of genetic factors in the occurrence of environmentally dependent human pathology                                                                                                                                | - | 2 | - | 4, 8 |                                                             |                              | Express-interview, electronic tests, reporting and defense of the essays, colloquium* |
| 1.6. | Environmental and medical consequences of air pollution. Factors and sources of air pollution. Global and local environmental consequences of air pollution.<br>Lab.w.: «Assessment of ozone level in ambient air»                                  | - | 2 | - | 4, 8 | Assessment of the level of pollution in the atmospheric air | Account on laboratory work   | Express-interview, electronic tests, reporting and defense of the essays              |
| 1.6. | Environmental and medical consequences of air pollution. Medical consequences of air pollution. Acute and chronic effects of pollutants on the human body.<br>Lab.w.: «Assessment of non-carcinogenic risks due to air pollution»                   | - | 2 | - | 4, 8 | Assessment of non-carcinogenic risks due to air pollution   | Solving situational problems | Express-interview, electronic tests, reporting and defense of the essays              |
| 1.7. | Environmental and medical consequences of hydrosphere pollution. Factors and sources of hydrosphere pollution. Global and local environmental consequences of hydrosphere pollution                                                                 | - | 2 | - | 4, 8 |                                                             |                              | Express-interview, electronic tests, reporting and defense of the essays              |
| 1.7. | Environmental and medical consequences of hydrosphere pollution. Medical consequences of hydrosphere pollution. Acute and chronic effects of pollutants on the human body.<br>Lab.w.: «Quantitative estimation of sulfates level in drinking water» | - | 2 | - | 4, 8 | Assessment of the level of pollution in drinking water      | Account on laboratory work   | Express-interview, electronic tests, reporting and defense of the essays              |
| 1.8  | Effect of the state of the lithosphere and the quality of food on population health. Factors and sources of lithosphere contamination. Migration of xenobiotics in the Biosphere                                                                    | - | 2 | - | 4, 8 |                                                             |                              | Express-interview, electronic tests, reporting and defense of the essays              |
| 1.8. | Effect of the state of the lithosphere and the quality of food on population health. Characteristics of food products. Preventive practices addressing potential adverse effects of xenobiotics ingested with foods.                                | - | 2 | - | 4, 8 | Food composition assessment                                 | Account on laboratory work   | Express-interview, electronic tests, reporting and defense of the essays              |

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|       | Lab. w.: «Food composition assessment»                                                                                                                                                                                           |     |   |     |         |                                                           | of the essays, colloquium*    |                                                                                   |
| 1.9.  | Medical aspects of the influence of the indoor environment on human health. Ecological characteristics of the environment of residential and public premises.<br>Lab.w.: «Assessment of the environmental cancer risk»           | -   | 2 | -   | 4, 6, 8 | Assessment of the environmental cancer risk               | Solving situational problems* | Express-interview, electronic tests, reporting and defense of the essays          |
| 1.9.  | Medical aspects of the influence of the indoor environment on human health. Non-ionizing electromagnetic radiation as a factor of the indoor environment.<br>Lab.w.: «Assessment of the electromagnetic environment in the room» | -   | 2 | -   | 4, 8    | Assessment of the electromagnetic environment in the room | Account on laboratory work    | Express-interview, electronic tests, reporting and defense of the essays          |
| 1.10. | Monitoring of the environment and the health status of the population                                                                                                                                                            | -   | 2 | -   | 8       |                                                           |                               | Express-interview, electronic tests, reporting and defense of the essays          |
| 1.11. | Regulatory and legal foundation of environment protection                                                                                                                                                                        | -   | 2 | -   | 8       |                                                           |                               | Express-interview, electronic tests, reporting and defense of the essays. Credit* |
|       | 5th semester                                                                                                                                                                                                                     |     |   |     |         |                                                           |                               |                                                                                   |
|       | Lectures                                                                                                                                                                                                                         | 9   | - | 3   |         |                                                           |                               |                                                                                   |
| 2.1.  | Effects of ionizing radiation                                                                                                                                                                                                    | 1,5 | - | 1,5 | 1, 8    |                                                           |                               | Interviews, preparation and presentation of abstracts                             |
| 2.2.  | Public exposure of humans. Background radiation                                                                                                                                                                                  | 1,5 | - | -   | 1, 8    |                                                           |                               |                                                                                   |
| 2.3.  | levels. Chernobyl Accident                                                                                                                                                                                                       |     |   |     |         |                                                           |                               |                                                                                   |
| 2.4.  | Biomedical consequences of irradiation. Radiosensitivity                                                                                                                                                                         | 1,5 | - | -   | 1, 8    |                                                           |                               |                                                                                   |
| 2.5.  | Radiation injuries to humans                                                                                                                                                                                                     | 1,5 | - | -   | 1, 8    |                                                           |                               |                                                                                   |

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| 2.6. | Deterministic and stochastic effects of radiation                                                                                                                                                                                                 | -   | -         | 1,5 | 1, 8    |                                                                                       |                              | Interviews, preparation and presentation of abstracts                    |
| 2.7. | Radiation safety                                                                                                                                                                                                                                  | 1,5 | -         | -   | 1, 8    |                                                                                       |                              |                                                                          |
| 2.8. | Reduction in radiation burden on population                                                                                                                                                                                                       | 1,5 | -         | -   | 1, 8    |                                                                                       |                              |                                                                          |
|      | <b>Laboratory lessons</b>                                                                                                                                                                                                                         | -   | <b>34</b> | -   |         |                                                                                       |                              |                                                                          |
| 2.1. | Effects of ionizing radiation. Physical basis of the action of ionizing radiation.<br>Laboratory work: «Calculation of the percentage of radionuclides after an accidental release»                                                               | -   | 2         | -   | 1, 8    | Calculation of the percentage of radionuclides after an accidental release            | Solving situational problems | Express-interview, electronic tests, reporting and defense of the essays |
| 2.1. | Effects of ionizing radiation. The effects of ionizing radiation on the biological objects.<br>Laboratory work: «Calculation of the time required to achieve a given activity in environmental objects»                                           | -   | 2         | -   | 1, 5, 8 | Calculation of the time required to achieve a given activity in environmental objects | Solving situational problems | Express-interview, electronic tests, reporting and defense of the essays |
| 2.1. | Effects of ionizing radiation. Methods of ionizing radiation registration. Introduction to dosimetry                                                                                                                                              | -   | 2         | -   | 1, 5, 8 |                                                                                       |                              | Express-interview, electronic tests, reporting and defense of the essays |
| 2.2. | Public exposure of humans. Background radiation levels. Natural background radiation                                                                                                                                                              | -   | 2         | -   | 1, 8    |                                                                                       |                              | Interviews, electronic tests, reporting and defense of the essays        |
| 2.2. | Public exposure of humans. Background radiation levels. Technologically modified radiation background.<br>Laboratory work: «Evaluation of the ambient dose equivalent rate of roentgen and gamma radiation by the MKC-6130A dosimeter-radiometer» | -   | 2         | -   | 1, 8    | Evaluation of the ambient dose equivalent rate of roentgen and gamma radiation        | Account on laboratory work   | Express-interview, electronic tests, reporting and defense of the essays |
| 2.3. | Chernobyl accident. Radiation accidents: concept, stages of evolving. Formation of population radiation doses during and after a radiation accident.<br>Laboratory work: «Evaluation of radioactive cesium incorporated in the human body»        | -   | 2         | -   | 1, 8    | Evaluation of radioactive cesium incorporated in the human body                       | Account on laboratory work   | Express-interview, electronic tests, reporting and defense of the essays |

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| 2.3. | Chernobyl accident. Characteristics of the mostly dose causing radionuclides. Radiation background in the Republic of Belarus nowadays. Medical consequences of the Chernobyl accident. Principles of protective measures.<br>Laboratory work: «Comparative profile of the main groups radionuclides» | - | 2 | - | 1, 8    | Comparative profile of the main groups radionuclides                    | Account on laboratory work   | Express-interview, electronic tests, reporting and defense of the essays              |
| 2.4. | Biomedical consequences of irradiation. Radiosensitivity                                                                                                                                                                                                                                              | - | 2 | - | 1, 5, 8 |                                                                         |                              | Express-interview, electronic tests, reporting and defense of the essays              |
| 2.5. | Deterministic and stochastic effects of radiation. Laboratory work: «Comparative profile of deterministic and stochastic effects of exposure»                                                                                                                                                         | - | 2 | - | 1, 5, 8 | Comparative profile of deterministic and stochastic effects of exposure | Account on laboratory work   | Interviews, electronic tests, reporting and defense of the essays                     |
| 2.5. | Deterministic and stochastic effects of radiation. Variants for dependence of stochastic effects in humans on received dose of low-dose range                                                                                                                                                         | - | 2 | - | 1, 5, 8 |                                                                         |                              | Express-interview, electronic tests, reporting and defense of the essays, colloquium* |
| 2.6. | Radiation injuries to humans. Acute radiation syndromes. Laboratory work: «Individual dosimetry. Measurement of an individual equivalent dose with a ДКС-АТ3509А dosimeter»                                                                                                                           | - | 2 | - | 1, 8    | Measurement of an individual equivalent dose                            | Account on laboratory work   | Express-interview, electronic tests, reporting and defense of the essays              |
| 2.6. | Radiation injuries to humans: dependence on the type and history of exposure; acute radiation sickness and chronic radiation sickness. Laboratory work: «Determination of the severity of acute radiation sickness (Human hemogram analysis)»                                                         | - | 2 | - | 1, 8    | Determination of the severity of acute radiation sickness               | Solving situational problems | Express-interview, electronic tests, reporting and defense of the essays              |
| 2.7. | Radiation safety. Prescriptive legal foundation for radiation safety. Principles of radiation safety, practical application                                                                                                                                                                           | - | 2 | - | 1, 8    |                                                                         |                              | Express-interview, electronic tests,                                                  |

|             |                                                                                                                                                                                                                                                                                                                                                                             |    |    |   |      |                                                                                                                                                  |                               |                                                                                     |
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|             |                                                                                                                                                                                                                                                                                                                                                                             |    |    |   |      |                                                                                                                                                  |                               | reporting and defense of the essays                                                 |
| 2.7.        | Radiation safety. Sealed and unsealed sources of ionizing radiation concept. Methods of protection against ionizing radiation at work with sources of ionizing radiation and appliances generating ionizing radiation.<br>Laboratory work: «Evaluation of the external radiation exposure of population living in a territory contaminated with radionuclides»              | -  | 2  | - | 1, 8 | Evaluation of the external radiation exposure of population living in a territory contaminated with radionuclides                                | Solving situational problems* | Express-interview, electronic tests, reporting and defense of the essays            |
| 2.8.        | Reduction in radiation burden on population. Medical exposure. Reduction of medical exposure of patients and members of the public from the sources of ionizing radiation used for medical purposes.<br>Laboratory work: «Evaluation of the long-term radiation exposure of the population due to entry of radionuclides into the human body by oral and inhalation routes» | -  | 2  | - | 1, 8 | Evaluation of the long-term radiation exposure of the population due to entry of radionuclides into the human body by oral and inhalation routes | Solving situational problems* | Express-interview, electronic tests, reporting and defense of the essays            |
| 2.8.        | Reduction in radiation burden on population. Emergency exposure situation. Decision making criteria for protecting members of the public in radiation accidents. Reducing the annual effective dose from external exposure                                                                                                                                                  | -  | 2  | - | 1, 8 |                                                                                                                                                  |                               | Express-interview, electronic tests, reporting and defense of the essays            |
| 2.8.        | Reduction in radiation burden on population. Reducing the committed effective dose from internal exposure. Principles of habitation on the terrains contaminated with radionuclides.<br>Laboratory work: «A set of measures to diminish the annual effective dose from external and internal exposure»                                                                      | -  | 2  | - | 1, 8 | A set of measures to diminish the annual effective dose from external and internal exposure                                                      | Solving situational problems* | Express-interview, electronic tests, reporting and defense of the essays.<br>Credit |
| Total hours |                                                                                                                                                                                                                                                                                                                                                                             | 15 | 68 | 6 |      |                                                                                                                                                  |                               |                                                                                     |

\*This is a mandatory form of current certification (each student will receive a certificate)

\*This is a mandatory form of current certification (each student will receive a mark)