

**DESCRIPTION OF COURSE UNIT FOR DOCTORAL STUDIES  
AT VILNIUS UNIVERSITY**

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| <b>Scientific Area/eas, Field/ds of Science</b>  | Medical and Health Sciences (M 000): Medicine (M 001)  |                 |                      |                   |
| <b>Faculty, Institute, Department/Clinic</b>   | Faculty of Medicine<br>Institute of Biomedical Sciences<br>Clinic of Internal Medicine, Oncology and General Practise  |                 |                      |                   |
| <b>Course unit title</b><br>(ECTS credits, hours)  | <b>Cancer Radiotherapy and Systemic Treatment</b><br>5 credits (135 hours)   |                 |                      |                   |
| <b>Study method</b>  | <b>Lectures</b>  | <b>Seminars</b> | <b>Consultations</b> | <b>Self-study</b> |
| Number of ECTS credits   | -  | -               | 1                    | 4                 |
| <b>Method of the assessment</b><br>(in 10 point system)  | <p>Presentation.<br/>Evaluation of the presentation: the presentation is presented on a agreed topic, which needs to be discussed with the coordinating lecturer (the student must analyze, review and present the latest scientific data related to the respective topic).<br/>Criteria for evaluation of presentation (minimum score - 5):<br/>(a) novelty and relevance of the material presented (2 points);<br/>(b) general structure and scope of the presentation, clear data, reasoning, conciseness and specificity (2 points);<br/>(c) summary of the presentation, justification of conclusions (2 points);<br/>(d) raising problematic issues (2 points);<br/>(e) organization of visual aids, ability to participate in a discussion, management of questions, oratory skills (2 points).</p> |                 |                      |                   |
| <b>PURPOSE OF THE COURSE UNIT</b>  |  |                 |                      |                   |
| <p>To provide theoretical and practical knowledge based on the latest scientific data related to systemic anti-cancer treatment and radiotherapy, the characteristics of the application of these treatments, the principles of prescribing, evaluation of treatment response, possible side effects, promoting a holistic approach to patients with cancer.</p>   |  |                 |                      |                   |
| <b>THE MAIN TOPICS OF COURSE UNIT</b>  |  |                 |                      |                   |
| <p>Chemotherapy of malignancies, main classes of cytotoxic drugs, pharmacokinetics, pharmacodynamics, clinical trials in oncology.<br/>Information provided to patient with cancer receiving systemic anti-cancer treatment, education for adverse events, multidisciplinary team – MDT - (oncologist, chemotherapist, oncologist, social worker, dietician, psychologist / psychiatrist, palliative care specialist, surgeon, etc.). MDT role in cancer management.<br/>Methods of chemotherapy administration, their types (intravenous, intraarterial, intraperitoneal, hyperthermic, chemoembolization, intrathecal), theoretical validity and practical application.<br/>Importance of chemotherapy dose, principles of calculation, indications for dose adjustment. Concepts of chemoresistance and sensitivity to chemotherapy, their meaning for the treatment efficacy.<br/>Principles of treatment with targeted and biological therapy, the importance of genetic testing. Principles of immunotherapy treatment, its administration for various types of cancer. Mechanisms of antitumor action of hormone therapy, its application for cancer treatment.<br/>Diagnosis and management of adverse reactions associated with systemic anti-cancer therapy.</p> |  |                 |                      |                   |

The concept of individual treatment (precision oncology) in the current context of oncological disease, recent research data in this field and treatment options. Palliative chemotherapy, its significance, indications. Importance of other drugs (bisphosphonates, pain killers, other symptomatic agents) in the management of oncological diseases, impact on quality of life. Interaction of ionizing radiation with biological material. Lethal, sublethal and potentially lethal cell lesions, their characteristics. Peculiarities of tumour growth and factors influencing tumour growth. Reaction of healthy tissues and organs to ionizing radiation. Interaction between ionizing radiation and chemotherapy. Principles of radiobiology. The significance and place of medical physics in radiation therapy. Radiation damage to healthy tissues, their types and manifestations, evaluation scales. Devices for forming the dose distribution in the body: blocks, wedges, multi-leaf diaphragm, foci. Tolerant doses, dependence on tissue morphology, structure. Evidence-based radiation therapy. Radiation therapy planning: goals, methods. Preoperative radiotherapy. Postoperative radiation therapy. Coordinated radiation therapy. Intraoperative radiation therapy. Modulated intensity radiation therapy: advantages, problems. Stereotactic radiotherapy. Palliative radiotherapy. Quality assurance of radiation therapy according to European and Lithuanian law. The place of radiation therapy in oncology: frequency of application, effectiveness. Radiation therapy for lymphomas. Radiation therapy for brain tumours. Radiation therapy of thyroid cancer. Radiation therapy of head and neck tumours. Radiation therapy for breast tumours. Radiation therapy for lung cancers. Radiation therapy for prostate tumours. Radiation therapy for bladder tumours, Radiation therapy for tumours of the rectum. Radiation therapy for cervical cancer. Radiation therapy for ovarian tumours. Radiation therapy for bones and soft tissue cancers. Radiation therapy in non-neoplastic pathology. Side effects of radiation therapy, management of side effects.

### **RECOMMENDED LITERATURE SOURCES**

1. Clinical Radiation Oncology. 4th Edition. 2016. Authors: Leonard L. Gunderson, Joel E. Tepper
2. Brachytherapy. An International Perspective. 2016. Editors: Montemaggi, Paolo, Trombetta, Mark, Brady, Luther W.
3. Perez & Brady's Principles and Practice of Radiation Oncology, Sixth edition. 2013. Authors: Edward C. Halperin, Luther W. Brady, Carlos A. Perez, David E. Wazer.
4. Introducing Palliative Care 5th Edition Paperback – 13 Jun 2016 by Twycross and Wilcock (Author), Robert Twycross (Editor), Andrew Wilcock (Editor)
5. Cancer Clinical Trials: Current and Controversial Issues in Design and Analysis (Chapman & Hall/CRC Biostatistics Series) Hardcover – 7 Jul 2016 by Stephen L. George (Editor), Xiaofei Wang (Editor), Herbert Pang (Editor).
6. Devita, Hellman, and Rosenberg's Cancer, Principles and Practice of Oncology: Review Paperback – 1 Jul 2016 by Ramaswamy Govindan (Editor), Daniel Morgensztern (Editor)
7. Novel Approaches and Strategies for Biologics, Vaccines and Cancer Therapies Hardcover – 5 Jan 2015 by Manmohan Singh (Editor), Maya Salnikova (Editor).
8. Oxford Handbook of Oncology 4/e (Flexicover) (Oxford Medical Handbooks) Flexibound – 13 Aug 2015 by Jim Cassidy (Editor), Donald Bissett (Editor), Roy A. J. Spence BE (Editor), Miranda Payne (Editor), & 1 more.
9. A Practical Guide to Designing Phase II Trials in Oncology (Statistics in Practice) Hardcover – 13 May 2014 by Sarah R. Brown (Author), Walter M. Gregory (Author), Christopher J. Twelves (Author), & 1 more.
10. Physician's Cancer Chemotherapy Drug Manual 2013 (Jones & Bartlett Learning Oncology) Spiral-bound – 22 Feb 2013 by Edward Chu (Author), Vincent T. DeVita (Author)

| <b>CONSULTING LECTURERS</b>  |
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| 1. <u>Coordinating lecturer</u> : Vincas Urbonas (Assoc. Prof. Dr.).   |
| 2. Ernestas Janulionis (Lect. Dr.).  |
| <b>APPROVED:</b>   |
| By Council of Doctoral School of Medicine and Health Sciences at Vilnius University:<br>29 <sup>th</sup> of September 2022 |
| Chairperson of the Board: Prof. Janina Tutkuvienė  |