# CLINICAL ONCOLOGY


## CLINICAL MEDICINE 3

### FIFTH YEAR

2023/2024.

Subject:

# CLINICAL ONCOLOGY

The course is evaluated with 3 ECTS. There are 3 hours of active teaching per week (2 hour of lectures and 1 hour of work in a small group).

**Teachers:**

| SB | Name and surname | e-mail address | Title |
|---|---|---|---|
| 1 | Ivan Jovanovic | ivanjovanovic77@gmail.com | Full professor |
| 2 | Radisa Vojinovic | rhvojinovic@gmail.com | Associate professor |
| 3 | Snezana Radovanovic | jovanarad@yahoo.com | Associate professor |
| 4 | Aleksandar Cvetkovic | alex777yu@yahoo.com | Associate professor |
| 5 | Aleksandar Dagovic | dagovic@sbb.rs | Assistant professor |
| 6 | Vesna Ignjatovic | vesnaivladaignjatovic@gmail.com | Assistant professor |
| 7 | Vladimir Vukomanovic | vukomanovic@gmail.com | Assistant professor |
| 8 | Marija Zivković Radojevic | makizivkovimarija@gmail.com | Assistant professor |
| 9 | Neda Milosavljevic | neda.milosavljevic@yahoo.com | Assistant professor |
| 10 | Marko Spasic | drmspasic@gmail.com | Assistant professor |
| 11 | Marina Markovic | maki.49@hotmail.com | Teaching assistant |
| 12 | Katarina Vuleta nedic | kvuleta@gmail.com | Teaching assistant |

# COURSE STRUCTURE:

| **Module** | **Name of the module** | **Weeks** | **Lectures weekly** | **Work in a small group per week** | **Teacher in charge** |
|---|---|---|---|---|---|
| 1 | Clinical oncology: basic principles and practice 1 | 7 | 2 | 1 | Vladimir Vukomanovic |
| 2 | Clinical oncology: basic principles and practice 2 | 8 | 2 | 1 | Vladimir Vukomanovic |
| | | | | | Σ 30+15=45 |

## EVALUATION:

In the points-based grading system, the grade is equivalent to a total number of points earned in a class and each activity (see tables):

**ACTIVITY DURING THE LESSON:**

Students can earn up to 30 points: from lecture attendance up to 10 points and answering exam questions from lecture week during the work in a small group and receiving maximum 20 points.

**MODULE TESTS:**

Student can earn up to 40 points according to the attached table.

**FINAL EXAM:**

Students can earn up to 30 points, at final evaluation of acquired knowledge and skills. The final exam covers the overall knowledge throughout the entire lesson materials and curriculum. Examinations are performance assessments and can be carried out in written and/or oral form. The final examination is held before a committee.

| MODULE | | MAXIMUM NUMBER OF POINTS | | | |
|---|---|---|---|---|---|
| | | **Activity during the lesson** | **Module tests** | **Final exam** | **Σ** |
| 1 | **Clinical Oncology: Basic Principles and Practice 1** | 14 | 20 | | 34 |
| 2 | **Clinical Oncology: Basic Principles and Practice 2** | 16 | 20 | | 36 |
| | | | | 30 | 30 |
| **Σ** | | **30** | **40** | **30** | **100** |

**TEACHING CONSULTATIONS**: Consultations can be scheduled with the head of the department, Asst. Prof. Dr Vladimir Vukomanović, vukomanovic@gmail.com

**The final grade is formed as follows:**

In order to pass the course, the student must obtain a minimum of 51 points, and pass all the modules.
In order to pass the module, the student must:
1. earn more than 50% of points from the module
2. earn more than 50% of points from activity during the lessons
3. pass the module test, with minimum 50% of correct answers

Passing all the modules, the student can gain the maximum of 70 points. Passing the final exam, the student can earn the maximum of 30 points in addition. The final grade is formed as the sum of total number of points from the module and the final exam, in accordance with the table.

| Number of points won | Grade |
|---|---|
| 0 - 50 | **5** |
| 51 - 60 | **6** |
| 61 - 70 | **7** |
| 71 - 80 | **8** |
| 81 - 90 | **9** |
| 91 - 100 | **10** |

# MODULE TESTS

## MODULE 1

### MODULE 1 TEST
**0--20 POINTS**

The test has 20 questions.
Each question is worth 1 points.

## MODULE 2

### MODULE 2 TEST
**0--20 POINTS**

The test has 20 questions.
Each question is worth 1 points

| Module | The name of the textbook | Authors | Publisher | The library |
|---|---|---|---|---|
| **Clinical Oncology: Basic Principles and Practice 1 and 2** | Cancer, Principles and practice of Oncology | DeVita, Hellman, Rosenberg Williams&Wilkins. | Wolters Kluver Lippincott Williams&Wilkins 10th edition, 2015 | YES |
| | Perez & Brady's Principles and Practice of Radiation Oncology. | Halperin EC, Wazer DE, Perez CA. Brady LW | LWW Lippincott Williams and Wilkins 7th ed, 2018. | No |
| | Nuclear Medicine and Molecular Imaging: The Requisites. | O'Malley J, Ziessman H | Elsevier Science 5th Edition. 2020. | No |
| | Walter and Miller's Textbook of Radiotherapy: Radiation Physics, | Symonds, R Paul. | Elsevier Science, 2019. | No |
| | Nuclear Medicine: A Core Review. | Shah C, Bradshaw M, Dalal I. | Wolters Kluver Lippincott Williams&Wilkins 2ed edition, 2021. | YES |
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**The lectures and presentations can be found on the website of the Faculty of Medical Sciences: www.medf.kg.ac.rs**

# PROGRAM:

## FIRST MODULE
## CLINICAL ONCOLOGY: BASIC PRINCIPLES AND PRACTICE 1

TEACHING UNIT 1 (FIRST WEEK)

DEFINITION AND CHARACTERISTICS OF MALIGNANT TUMORS

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • Basics principle oncology<br>• Molecular biology of cancer<br>• Oncogenesis<br>• Molecular principles of tissue invasion and metastasis | Basic principles in oncology |

TEACHING UNIT 2 (SECOND WEEK)

ETIOLOGY AND EPIDEMIOLOGY OF CANCER

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • Etiology of cancer<br>• Epidemiology of Cancer and Prevention Strategies<br>• Global cancer incidence and mortality<br>• Demographic factors that affect risk<br>• Temporal Trends. Performance characteristics of a screening test<br>• Incidence and mortality patterns for common cancers. prevention and early detection | Etiology and epidemiology of malignant tumors<br>. |

TEACHING UNIT 3 (THIRD WEEK)

BASIC PRINCIPLES OF CANCER DIAGNOSTICS

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • Diagnostics in malignant tumors<br>• Principles of patient assessment<br>• The validity of serum tumor markers in oncology<br>• Basic cancer pathology<br>• The principles of cancer staging | Basic principles of diagnostics in cancer assessment<br>. |

TEACHING UNIT 4 (FOURTH WEEK)

NUCLEAR MEDICING CANCER IMAGING

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • Devices in nuclear medicine ( gamma camera, SPECT, PET)<br>• Scintigraphy with tumorotropic radiopharmaceuticals. Molecular imaging using various radiopharmaceuticals<br>• 18FDG PET CT imaging (staging, radiotherapy planing, PERCIST)<br>• Immunoscintigraphy<br>• Lymphoscintigraphy: sentinel node detection<br>• Somatostatin receptor scintigraphy | Role of nuclear medicine in cancer diagnosis and therapy |

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TEACHING UNIT 5 (FIFTH WEEK)

RADIONUCLIDE THERAPY OF MALIGNANT TUMORS

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • Therapeutic Radionuclides: Biophysical and Radiobiologic Principles<br>• Treatment of Differentiated Thyroid Cancer. Peptide Receptor Radionuclide Therapy. Radionuclide Therapy of Bone Metastases.<br>• Radionuclide theraopy of Medullary Thyroid Carcinoma, pheochromocytoma, neuroblastoma<br>• Radioimmunotherapy. Intra-arterial Therapy of Liver Tumours. | Nuclear Medicine Therapy: Principles and Clinical Applications |

TEACHING UNIT 6 (SIXTH WEEK)

RADIOLOGICAL CANCER IMAGING

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • Structural Imaging: Computed Tomography (CT) Magnetic Resonance Imaging (MRI) Ultrasound (US)<br>• Imaging in head and neck tumors, lung, breast, abdominal tumors.<br>• Neuroradiology.<br>• Tumor staging. Post-treatment Evaluation. RECIST | Role of radiological imaging in cancer management |

TEACHING UNIT 7 (SEVENTH WEEK)

BASIC PRINCIPLES OF RADIOTHERAPY: BASIC PHYSICS AND RADIOBIOLOGY

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • Physics and chemistry of radiation interactions with matter. Molecular and cellular radiobiology. Radiobiological basis of radiation protection<br>• Radioprotectors and radiosensitizers | General principles of radiation therapy |

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## SECOND MODULE
## CLINICAL ONCOLOGY: BASIC PRINCIPLES AND PRACTICE 2

TEACHING UNIT 8 (EIGHT WEEK)

GENERAL PRINCIPLES OF RADIATION THERAPY

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • Radiotherapy machines. Types of external radiotherapy<br>• Transcutaneous radiotherapy. Target Volume Delineation<br>• Modern Radiotherapy Techniques<br>• Brachytherapy | General principles of radiation therapy |

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TEACHING UNIT 9 (NINTH WEEK)

RADIATION THERAPY IN THE MANAGEMENT OF VARIOUS CANCERS

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • Radiation therapy techniques in cancer treatment (breast, lung, digestive, gynecological cancers, lymphoma...) | General principles of radiation therapy |

TEACHING UNIT 10 (TENTH WEEK)

CLINICAL TREATMENT OF VULNERABLE POPULATIONS IN RADIATION ONCOLOGY

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • Palliative radiotherapy<br>• Radiotherapy in geriatric cancer patients<br>• Advances in radiotherapy for pediatric cancer patients<br>• Side effects of radiotherapy | General principles of radiation therapy |

TEACHING UNIT 11 (ELEVENTH WEEK)

BASIC PRINCIPLES OF SURGICAL ONCOLOGY

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • Basic principles of surgical oncology<br>• Surgical emergencies in oncology<br>• Palliative surgery<br>• Reconstructive Surgery | Basic principles of surgical oncology |

TEACHING UNIT 12 ( TWELFTH WEEK )

BASIC PRINCIPLES OF CHEMOTHERAPY

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • Traditional cytotoxic antineoplastic agents.<br>• Basic concept of cancer cell growth cell kinetics and growth fraction<br>• The Different Mechanisms of Cancer Drug Resistance<br>• Chemotherapy Regimens ((breast, lung, digestive, gynecological cancers, lymphoma... | Basic principles of chemotherapy |

TEACHING UNIT 13 ( THIRTEENTH WEEK )

LATEST ADVANCES IN MEDICAL ONCOLOGY

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • The Principles of Targeted Therapy for Cancer Treatment<br>• The biological therapy of cancer<br>• Cancer immunotherapy<br>• Antitumor Drugs and Their Targets | Advancements in clinical aspects of targeted therapy and immunotherapy in oncology |

TEACHING UNIT 14 ( FOURTEENTH WEEK )

## MANAGEMENT OF ADVERSE EFFECTS OF CHEMOTHERAPY

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • Management of adverse effects of chemotherapy<br>• Oncologic emergencies | Management of adverse effects of oncological therapy |

TEACHING UNIT 15 ( FIFTEENTH WEEK )

## BEST SUPPORTIVE CARE AND QUALITY OF LIFE

| 2 hours of lectures | 1 hour of work in a small group |
|---|---|
| • Management of Cancer Pain<br>• Psychological Issues<br>• Specific Problems in the Setting of Advanced Cancer<br>• Specialized Care of the Terminally Ill | Supportive care needs and health-related quality of life in cancer patients |

# WEEKLY COURSE SCHEDULE

| COURSE | THURSDAY |
|---|---|
| **CLINICAL ONCOLOGY (2+1)** | **LECTURES**<br>**12:15 - 13:45**<br>(Hall on the 8th floor of UCCK)<br><br>**PRACTICE**<br>**14:30-17:30**<br>(Centre for NM UCCK) |

| module | week | place | type | method unit name |
|---|---|---|---|---|
| 1 | 1 | **L** | DEFINITION AND CHARACTERISTICS OF MALIGNANT TUMOURS | Ivan Jovanovic |
| 1 | 1 | **P** | DEFINITION AND CHARACTERISTICS OF MALIGNANT TUMOURS | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| 1 | 2 | **L** | ETIOLOGY AND EPIDEMIOLOGY OF CANCER | Snezana Radovanovic |
| 1 | 2 | **B** | ETIOLOGY AND EPIDEMIOLOGY OF CANCER | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| 1 | 3 | **L** | BASIC PRINCIPLES OF CANCER DIAGNOSTIC | Vladimir Vukomanovic |
| 1 | 3 | **B** | BASIC PRINCIPLES OF CANCER DIAGNOSTIC | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| 1 | 4 | **L** | NUCLEAR MEDICINE IMAGING | Vladimir Vukomanovic |

| module | week | place | type | method unit name |
|---|---|---|---|---|
| 1 | 4 | **B** | NUCLEAR MEDICINE CANCER IMAGING | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| 1 | 5 | **L** | RADIONUCLIDE THERAPY OF MALIGNANT TUMORS | Vesna Ignjatovic |
| 1 | 5 | **B** | NUCLEAR MEDICINE CANCER THERAPY | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| 1 | 6 | **L** | RADIOLOGICAL CANCER IMAGING | Radisa Vojinovic |
| 1 | 6 | **B** | RADIOLOGICAL CANCER IMAGING | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| 1 | 7 | **L** | INTRODUCTION TO RADIOTHERAPY. BASIC PRINCIPLES OF RADIOTHERAPY | Neda Milosavljevic |

| module | week | place | type | method unit name |
|---|---|---|---|---|
| 1 | 7 | **B** | INTRODUCTION TO RADIOTHERAPY. BASIC PRINCIPLES OF RADIOTHERAPY. | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| 2 | 8 | **L** | BASIC PRINCIPLES OF RADIOTHERAPY | Neda Milosavljevic |
| 2 | 8 | **B** | BASIC PRINCIPLES OF RADIOTHERAPY | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| 2 | 9 | **L** | RADIATION THERAPY IN THE MANAGEMENT OF VARIOUS CANCERS | Marija Zivkovic Radojevic |
| 2 | 9 | **B** | RADIATION THERAPY IN THE MANAGEMENT OF VARIOUS CANCERS | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| 2 | 10 | **L** | CLINICAL TREATMENT OF VULNERABLE POPULATIONS IN RADIATION ONCOLOGY | Marija Zivkovic Radojevic |

| module | week | place | type | method unit name |
|---|---|---|---|---|
| 2 | 10 | **B** | CLINICAL TREATMENT OF VULNERABLE POPULATIONS IN RADIATION ONCOLOGY | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| 2 | 11 | **L** | BASIC PRINCIPLES OF SURGICAL ONCOLOGY | Aleksandar Cvetković<br>Marko SLasić |
| 2 | 11 | **B** | BASIC PRINCIPLES OF SURGICAL ONCOLOGY | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| 2 | 12 | **L** | BASIC PRINCIPLES OF CHEMOTHERAPY | Neda Milosavljevic |
| 2 | 12 | **B** | BASIC PRINCIPLES OF CHEMOTHERAPY | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| 2 | 13 | **L** | LATEST ADVANCES IN MEDICAL ONCOLOGY | Vladimir Vukomanovic |

| module | week | place | type | method unit name |
|---|---|---|---|---|
| 2 | 13 | **B** | LATEST ADVANCES IN MEDICAL ONCOLOGY | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| 2 | 14 | **L** | MANAGEMENT OF ADVERSE EFFECTS OF CHEMOTHERAPY | Marija Zivkovic Radojevic |
| 2 | 14 | **B** | MANAGEMENT OF ADVERSE EFFECTS OF CHEMOTHERAPY | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| 2 | 15 | **L** | SUPPORTIVE TREATMENTS AND QUALITY OF LIFE PATIENTS WITH CANCER | Neda Milosavljevic |
| 2 | 15 | **B** | SUPPORTIVE TREATMENTS AND QUALITY OF LIFE PATIENTS WITH CANCER | Aleksandar Dagovic<br>Vladimir Vukomanovic<br>Vesna Ignjatovic<br>Marija Zivkovic Radojevic<br>Neda Milosavljevic<br>Marina Markovic<br>Katarina Vuleta Nedic |
| | | | **Exam** | |