**DESCRIPTION OF THE COURSE OF STUDY**

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| **Course code** | 0912-7LEK-C6.12-N |
| **Name of the course in**  | Polish | Neurochirurgia |
| English | Neurosurgery |

1. **LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES**

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| **1.1. Field of study** | medicine |
| **1.2. Mode of study** | Full-time |
| **1.3. Level of study** | Uniform Master’s studies |
| **1.4. Profile of study\*** | General academic |
| **1.5. Person preparing the course description** | Jarosław Andrychowski MD PhD D Sc Profesor JKU |
| **1.6. Contact** |  |

1. **GENERAL CHARACTERISTICS OF THE COURSE OF STUDY**

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| **2.1. Language of instruction** | English |
| **2.2. Prerequisites\*** | Anatomy, Physiology, Surgery |

1. **DETAILED CHARACTERISTICS OF THE COURSE OF STUDY**

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| * 1. **Form of classes**
 | **LECTURE: 15 (including 3hours of e-learning) , ĆLASSES -15, PRACTICAL CLASSES 15**  |
| * 1. **Place of classes**
 | Lecture – Classes in classrooms of JKUClasses- Department of Neurosurgery of Regional Hospital (WSZ) in Kielce |
| * 1. **Form of assessment**
 | **LECTURE – E, ĆLASSES – Credit with grade** |
| * 1. **Teaching methods**
 | seminar lecture, discussion, case study in natural conditions. |
| * 1. **Bibliography**
 |  **Required reading** | **1.Handbook of Neurosurgery** By (author) Mark S. Greenberg 1784 pages 23 Oct 2019 Publisher [Thieme Medical Publishers Inc](https://www.bookdepository.com/publishers/Thieme-Medical-Publishers-Inc), **2.Neurosurgery Fundamentals,** [Nitin Agarwal](https://www.libristo.pl/autorzy/Nitin%20Agarwal.html)432pp [Thieme Medical Publishers Inc](https://www.libristo.pl/wydawnictwo/Thieme%20Medical%20Publishers%20Inc.html%22%20%5Co%20%22Thieme%20Medical%20Publishers%20Inc) November 2018 |
| **Further****reading** | 1.YOUMANS AND WINN NEUROLOGICAL SURGERY,  4-VOLUME SET, 7TH EDITION 20162. Benzel's Spine Surgery 2-Volume Set, 4th EditionTechniques, Complication Avoidance and ManagementAuthor Michael P Steinmetz & Edward C. BenzelDate of Publication: September 20163.Practical Neurosurgery Chandrashekhar Deopujari, Vedantam Rajshekhar, Sanjay Behari, Natarajan Muthukumar 528pp Thieme Medical Publishers: 06. November 2019**Historical position** 1.Bidziński J. (red.): Neurochirurgia. Wydawnictwo Lekarskie PZWL,Warszawa 1981. First book for Neurosurgery in Poland (in Polish)  |

1. **OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES**

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| * 1. **Course objectives (including form of classes)**

C1. Obtaining knowledge on modern clinical neurosurgery, contemporary pediatric and adult neurosurgery via theoretical and practical classes C2. Preparation for examination and clinical evaluation of neurosurgical patient, identification of diseases which cause direct risk of life. Planning diagnostic procedures. Development of decisions making process in neurosurgery. C3. Conservative treatment and patient monitoring policies before operative treatment. C4. Principles of interdisciplinary cooperation. Consulting other departments, clinical cooperation. Neurosurgical supervision of other hospitals.  |

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| **4.2. Detailed syllabus (including form of classes)****Lectures** 1. History of neurosurgery in Poland and development of global neurosurgery
2. Life-threatening diseases in neurosurgical clinic. Assessment of consciousness and handling unconscious patients.
3. Intracranial, brain and spinal canal tumors – classification, characteristics, and clinical symptoms.
4. Contemporary diagnostic of intracranial and spinal canal tumors. Operative treatment. Skull base surgery.
5. Neurosurgical monitoring techniques. Operations of tumors in functional areas.

Radiosurgery, Stereotactic, Gamma knife and Cyber knife. 1. Vascular diseases of central nervous system – symptoms, diagnostics. Subarachnoid bleeding and intracerebral bleeding – cause, diagnostics, microsurgery, interventional radiology and radiosurgery.
2. Intracranial aneurysms- treatment. Intracranial and intramedullary angiomas - treatment
3. Rare vascular diseases Dural- arterio- venous fistula. Insufficiency of cerebral circulation. Cerebral bypass.
4. Common congenital disorders – neurosurgical diagnosis and treatment.
5. Head injuries, central nervous system injuries. Differences in injuries in children and adults.
6. Spine and spinal cord trauma. Differences in injuries in children and adults.
7. Spine degenerative diseases. Intervertebral disc disease – diagnosis, qualification for treatment. Neurosurgical treatment depending on the symptoms and course of the disease.
8. Peripheral nerves: Tumors, entrapment syndrome, injuries. Symptoms, diagnosis and treatment.
9. Parkinsonism and other extrapyramidal diseases – contemporary neurosurgical procedures – deep brain stimulation, neuromodulation.
10. Pain management. Stimulation. Radiosurgery. Robotics in neurosurgery.

**Practical activities**1.Anatomy of nervous system; brain, spinal cord, peripheral nervous system 2.Patient consciousness assessment score. Neurological examination. Clinical management of unconscious patient. 3.Diagnosing nervous system disorders - diagnostic techniques. Invasive Diagnostics. Not Invasive Diagnostics.  MRI, CT, vascular examinations, ophthalmology in neurosurgery.4.Diagnostic techniques and clinical interpretation CT scan, MRI, Angiography, Neurophysiology SEP, MEP, EMG,  Neurography of peripheral nerves. 5.Intracranial pressure - physiology and pathology. Intracranial pressure monitoring (ICP) and clinical application 6.Brain (cerebral) edema. Diagnostics, management, clinical application, high intracranial pressure monitoring and treatment. Barbiturate coma therapy.7.Conservative and surgical treatment in neurosurgery. Therapeutic decision-making process. 8. Micro-surgical techniques in neurosurgery. Minimally invasive procedures. Micro instruments. Neurosurgical technology. Microscopes. Intraoperative monitoring 9. Post-operative care in neurosurgery. Outpatient care. 10.Observation of operational procedures with clinical and medical follow-up comments. |

**4.3 Intended learning outcomes**

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| **Code** | **A student, who passed the course** | **Relation to learning outcomes** |
| within the scope of **KNOWLEDGE**: |
| W01 | knows environmental and epidemiological conditions for the most common diseases; | E.W1. |
| W02 | knows and distinguishes basic neurological syndromes;  | E.W13. |
| W03 | knows and understand the causes, symptoms, principles of diagnosis and therapeutic management of the most common diseases of the nervous system, including:a) headaches: migraine, tension headaches and bands headaches and trigeminal neuralgia of nerve V; b) vascular diseases of the brain, in particular the stroke;c) epilepsy;d) infection of the nervous system, in particular meningitis, Lyme disease, HSV encephalitis, neurotransmitter disorders;e) dementia, in particular in Alzheimer's disease, frontotemporal dementia, vascular dementia, and other types of dementia; f) diseases of the basal ganglia, in particular Parkinson's disease; g) demyelinating diseases, in particular multiple sclerosis; h) diseases of the neuromuscular system, in particular amyotrophic lateral sclerosis and sciatica; i) cranio-cerebral trauma, in particular concussion; | E.W14. |
| within the scope of  **ABILITIES**: |
| U01 | conducts full and targeted physical examination of the adult patient; | E.U3. |
| U02 | conducts indicative study of hearing and sight as well as the otoscopic examination; | E.U6. |
| U03 | assesses patient’s general condition, consciousness and awareness; | E.U7. |
| U04 | performs differential diagnosis of the most common diseases in adults and children | E.U12. |
| U05 | assesses and describes the somatic and mental state of patients; | E.U13. |
| U06 | recognizes states of a direct threat to life; | E.U14. |
| U07 | plans diagnostic, therapeutic and preventive procedures; | E.U16. |
| U08 | conducts analysis of the potential side effects of each drug and the interaction between them; | E.U17. |
| U09 | qualifies the patient for home treatment and hospitalization; | E.U20. |
| U10 | defines states in which functional status of the patient's or his/her preferences restrict the treatment in accordance with specific guidelines for the disease; | E.U21. |
| U11 | interprets laboratory tests/results and identifies the reasons for deviations; | E.U24. |
| U12 | assists when the following procedures and medical treatments are performed: a) transfusions of blood and blood products,b) drainage of the pleural cavity, c) puncture of the pericardium, d) puncture of the peritoneal cavity, e) lumbar puncture, f) needle biopsy, g ) epidermal tests, h) intradermal and scarification tests and interpret their results; | E.U30. |
| U13 | plans specialist consultations; | E.U32. |
| U14 | evaluates decubitus and applies appropriate dressings; | E.U35. |
| U15 | complies with the aseptic and antiseptic rules; | F.U3. |

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| **4.4. Methods of assessment of the intended learning outcomes** |
| **Teaching** **outcomes****(code)** | **Method of assessment (+/-)** |
| **Exam oral/written** | **Test\*** | **Others** |
| ***Form of classes*** | ***Form of classes*** | ***Form of classes*** |
| *L* | *C* |  | *L* | *C* | *Practical classes* | *L/CPractical classes* |
| W01 | ***+*** |  |  |  |  |  |  |
| W02 | ***+*** |  |  |  |  |  |  |
| W03 | ***+*** |  |  |  |  |  |  |
| U01 |  |  |  |  | ***+*** | + |  |
| U02 |  |  |  |  | ***+*** | + |  |
| U03 |  |  |  |  | ***+*** | + |  |
| U04 |  |  |  |  | ***+*** | + |  |
| U05 |  |  |  |  | ***+*** | + |  |
| U06 |  |  |  |  | ***+*** | + |  |
| U07 |  |  |  |  | ***+*** | + |  |
| U08 |  |  |  |  | ***+*** | + |  |
| U09 |  |  |  |  | ***+*** | + |  |
| U10 |  |  |  |  | ***+*** | + |  |
| U11 |  |  |  |  | ***+*** | + |  |
| U12 |  |  |  |  | ***+*** | + |  |
| U13 |  |  |  |  | ***+*** | + |  |
| U14 |  |  |  |  | ***+*** | + |  |
| U15 |  |  |  |  | ***+*** | + |  |

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| **Criteria of assessment of the intended learning outcomes** |
| **Form of classes** | **Grade** | **Criterion of assessment** |
| **lecture (L)** | **3** |  Test results 61-68% |
| **3,5** | Test results 69-76% |
| **4** | Test results 77-84% |
| **4,5** | Test results 85-92% |
| **5** | Test results 93-100% |
| **Classes (C)\*** | **3** | Mastering the content of the curriculum at the basic level, chaotic answers, leading questions necessary.  |
| **3,5** | Mastering the content of the curriculum at the basic level, systematized answers, requires the help of a teacher. |
| **4** | Mastering the content of the curriculum at the basic level, systematized and independent answers. Problem solving in typical situations. |
| **4,5** | The scope of the presented knowledge goes beyond the basic level based on the supplementary literature provided. Problem solving in new and complex situations. |
| **5** | The scope of the presented knowledge goes beyond the basic level based on self-acquired scientific sources of information. |
| **Practical classes\*** | **3** | Mastering the content of the curriculum at the basic level, chaotic answers, necessary leading questions. |
| **3,5** | Mastering the content of the curriculum at the basic level, systematized answers, requires the help of a teacher. |
| **4** | Mastering the content of the curriculum at the basic level, systematized and independent answers. Problem solving in typical situations. |
| **4,5** | The scope of the presented knowledge goes beyond the basic level based on the supplementary literature provided. Problem solving in new and complex situations. |
| **5** | The scope of the presented knowledge goes beyond the basic level based on self-acquired scientific sources of information. |

1. **BALANCE OF ECTS CREDITS – STUDENT’S WORK INPUT**

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| **Category** | **Student's workload** |
| **Full-time** |
| *NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/* | ***45*** |
| *Participation in lectures\** | 12 |
| *Participation in classes, seminars, laboratories\** | 30 |
| *Preparation in the exam/ final test\** |  |
| *Others\** |  |
| *INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/* | ***5*** |
| *Preparation for the lecture\** | 5 |
| *Preparation for the classes, seminars, laboratories\** |  |
| *Preparation for the exam/test\** |  |
| *Gathering materials for the project/Internet query\** |  |
| *Preparation of multimedia presentation* |  |
| *Others (please specify e.g. e-learning)\** |  |
| ***TOTAL NUMBER OF HOURS*** | ***50*** |
| ***ECTS credits for the course of study*** | **2** |

***\*delete as appropriate***

***Accepted for execution (date and legible signatures of the teachers running the course in the given academic year)***

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