

# **CHARLES UNIVERSITY, FACULTY OF MEDICINE in PLZEN**

## **Subject: PATHOLOGY and ORAL PATHOLOGY (2<sup>nd</sup> and 3<sup>rd</sup> year)**

### **Detailed syllabus:**

#### **Topic 1: Introduction. Death of the organism. Cell injury and cell death.**

Content: pathology as a theoretical and clinical subject; biopsy; histology; cytology; immunohistochemistry; molecular genetics; fixation; form; autopsy; death; necrosis; apoptosis; pyroptosis; necroptosis; anoikis; ferroptosis

Duration: 1 week (1 lecture + 1 practical)

#### **Topic 2: Adaptations. Tissue healing. Pigments, calcifications, crystals, stones.**

Content: atrophy; hypertrophy; hyperplasia; metaplasia; proliferation; regeneration; reparation; granulation tissue; healing; organization; steatosis; lipidoses; mukopolysacharidoses; hyalin; proteinopathies; anthracosis; lipofuscin, ceroid, lipochrom, melanin, bilirubin, hemosiderin, lithiasis

Duration: 2 weeks (1 lecture + 2 practicals)

#### **Topic 3: Inflammation.**

Content: alteration; exudation; proliferation; exudate; inflammatory mediators; cytokines; complement; chemotaxis; opsonization; phagocytosis; pus; abscess; phlegmone; pseudomembrane; granuloma; SIRS; sepsis

Duration: 2 weeks (2 lectures + 1 practical)

#### **Topic 4: Hemodynamic disorders (hemostasis, thrombosis, embolia, hemorrhage, hyperemia, congestion, edema, infarction, shock).**

Content: circulatory insufficiency; heart failure; concentric hypertrophy; excentric hypertrophy; congestion; cyanosis; induration; shock; anemia; ischemia; hyperemia; hemostasis; thrombosis; embolia; hemorrhage; hemorrhagic diathesis; coagulopathies; thrombocytopenia; thrombocytopathies; vasculopathies

Duration: 1 week (1 lecture + 1 practical)

#### **Topic 5: Neoplasia (Molecular oncology, classification, grading, staging, paraneoplastic syndromes).**

Content: tumor; pseudotumor; neoplasm; benign; malignant; carcinoma; sarcoma; differentiation; anaplasia; invasive; infiltrative; expansive; pushing; metastases; paraneoplastic syndrome; typing; grading; staging; TNM; tumor markers; oncogenes; tumor suppressor genes; growth factors; receptors; signalling cascades; transcription factors; cyclins; angiogenesis; epithelial-mesenchymal transition; immune surveillance; genomic instability; precancerosis; dysplasia; pseudotumors; targeted therapy; precision medicine.

Duration: 1 week (1 lecture + 1 practical)

#### **Topic 6: Diseases of the immune system.**

Content: immune response; hypersensitive reaction; allergy; IgE; immune complex; autoimmune disease; immune deficiency; transplantation; rejection; GvHD; amyloidosis.

Duration: 1 week (1 lecture + 1 practical)

#### **Topic 7: Etiology of diseases (genetic, environmental, nutritional and infectious etiology of diseases).**

Content: Genetic, environmental, nutritional and infectious etiology of diseases: cytogenetic disorders; chromosomal aberrations; mutation; amplification; translocation; epigenetic changes; heredity; imprinting; malnutrition; intoxication; radiation; injury; infection; viruses; bacteria; parasites; protozoa; helminths; prions; mycoses; pneumoconioses; silicosis; asbestosis.

Duration: 1 week (1 lecture)

**Topic 8: Hematopathology (Pathology of lymph nodes and spleen. Bone marrow disorders).**

Content: lymph node; B-lymphocytes; T-lymphocytes; NK-cells; plasma cells; lymph node; lymphadenopathy; lymphadenitis; granuloma; Hodgkin's lymphoma; non-Hodgkin lymphomas; NHL; histiocytosis; splenomegaly; myeloproliferation; myelodysplastic syndrome; acute leukemia; chronic leukemia; plasma cell myeloma

Duration: 1 week (1 lecture + 1 practical)

**Topic 9: Pathology of the cardiovascular system.**

Content: Diseases of veins, arteries and lymphatic vessels. Diseases of the endocardium, myocardium and pericardium. Congenital developmental defects of the cardiovascular system. Hypertension; arteriosclerosis; atherosclerosis; arteriolosclerosis; aneurysm; dissection; vasculitis; varices; phlebothrombosis; thrombophlebitis; lymphangiopathy; lymphangiectasia; lymphedema; hemangioma; lymphangioma; angiosarcoma; congenital heart disease; endocarditis; valvular heart disease; ischemic heart disease; myocardial infarct; cardiomyopathy; myocarditis; pericarditis; rhabdomyoma; myxoma.

Duration: 1 week (1 lecture + 1 practical)

**Topic 10: Pathology of lung, pleura and mediastinum.**

Content: Non-neoplastic diseases of the lung, pleural cavity and mediastinum. Tumours of the lung and pleura. Congenital malformations of the lung; pulmonary vascular diseases; chronic obstructive pulmonary disease; emphysema; chronic bronchitis; asthma bronchiale; bronchiectasia; interstitial lung disease; granulomatous inflammation; pneumoconiosis; infectious pneumonia; fluidothorax; pneumothorax; pleuritis; mediastinitis; bronchogenic carcinoma; SCLC; NSCLC; squamous cell carcinoma; adenocarcinoma; small cell carcinoma; large cell carcinoma; carcinoid; chondrohamartoma; carcinomatous lymphangiopathy; mesothelioma; solitary fibrous tumor.

Duration: 1 week (1 lecture + 1 practical)

**Topic 11: Pathology of GIT (Pathology of digestive tube from esophagus to anus, and peritoneum).**

Content: esophagus; diverticuli; achalasia; reflux; GERD; esophagitis; Barrett; adenocarcinoma; squamous cell carcinoma; stomach; gastritis; gastropathy; Helicobacter; autoimmune; NSAID; peptic ulcer disease; intestinal type adenocarcinoma; diffuse type adenocarcinoma; GIST; MALT lymphoma; neuroendocrine; NEN; NET; NEC; intestine; malabsorption syndrome; celiac disease; gluten; Tropheryma; Whipple; EATL; inflammatory bowel disease; IBD; ulcerative colitis; Crohn; mucosal prolapse; polyps; CRC; familial colorectal cancer; FAP; Lynch; peritoneum; peritonitis; mesothelioma; secondary müllerian system; carcinosis; pseudomyxoma peritonei.

Duration: 1 week (1 lecture + 1 practical)

**Topic 12: Pathology of liver, biliary tree and pancreas (Non-neoplastic diseases and tumors of the liver, bile ducts, gallbladder and exocrine pancreas).**

Content: liver; gallbladder; biliary, jaundice; hepatitis; cirrhosis; HAV; HBV; HCV; autoimmune hepatitis; alcohol; steatohepatitis; metabolic syndrome; NAFLD; NASH; Wilson disease; hemochromatosis; Reye syndrome; biliary atresia; ciliopathies; polycystic disease; congenital hepatic fibrosis; Budd-Chiari syndrome; SOS; primary biliary cholangitis; primary sclerosing cholangitis; focal nodular hyperplasia; cavernous hemangioma; hepatocellular adenoma; hepatocellular carcinoma; HCC; intrahepatic cholangiocarcinoma; epithelioid hemangioendothelioma; angiosarcoma; cholelithiasis; cholecystitis; cholangitis; gallbladder carcinoma; Klatskin tumor; acute pancreatitis; chronic pancreatitis; pancreatic ductal adenocarcinoma; PDAC; IPMN; MCN; serous cystadenoma; SPN

Duration: 1 week (1 lecture + 1 practical)

**Topic 13: Pathology of urinary system (Pathology of kidney, ureter, bladder and urethra. Glomerular diseases and tubulointerstitial nephritis. Inflammatory diseases of the outflow urinary tract. Tumors of the kidney and outflow urinary tract) and Pathology of male genital (Pathology of penis, prostate, testis, testicular adnexae, and scrotum. Developmental diseases, inflammations and tumors).**

Content: kidney; ureter; urinary bladder; urethra; glomerulopathy; glomerulonephritis; nephrotic syndrome; nephritic syndrome; tubulointerstitial nephritis; pyelonephritis; urocystitis; polycystic disease; renal

insufficiency; renal failure; renal cell carcinoma; angiomyolipoma; PEComa; Wunderlich syndrome; transitional cell carcinoma; testis; testicular adnexae; epididymis; tunica albuginea; prostate; penis; scrotum; cryptorchidism; Klinefelter; androgen insensitivity syndrome; orchitis; germ cell; sex cord - stromal tumors; seminoma; embryonal carcinoma; yolk sac tumor; choriocarcinoma; teratoma; Sertoli cell; Leydig cell tumor; hydrocele; varicocele; spermatocele; testicular torsion; adenomatoid tumor; mesothelioma; papillary cystadenoma; prostate hyperplasia; prostatitis; prostatic adenocarcinoma; Gleason score; balanoposthitis; Peyronie's disease; condyloma accuminatum; PeIN; penile squamous cell carcinoma; Fournier's gangrene.

Duration: 1 week (1 lecture + 1 practical)

**Topic 14: Pathology of female genital (Pathology of the female reproductive system. Infections. Hormonal changes. Benign and malignant tumors); Pathology of breast (Developmental diseases of the breast. Regressive changes of the breast. Inflammatory breast lesions. Non-neoplastic and neoplastic lesions of mammary stroma. Benign epithelial lesions of the breast. Breast cancer) and Embryofetoperinatoneonatology.**

Content:

- cervix; HPV; cervical intraepithelial neoplasia; CIN; HSIL; LSIL; bacterial vaginosis; Trichomonas vaginalis, Neisseria gonorrhoeae; Candida albicans; pelvic inflammatory disease; PID; vulva, condyloma accuminatum; lichen sclerosus et atrophicus; vulvar intraepithelial neoplasia; VIN; vaginal intraepithelial neoplasia; VaIN; squamous cell carcinoma; endocervical adenocarcinoma; uterus; uterus unicornis; uterus septus; menstrual cycle; endometriosis; adenomyosis; endometrial hyperplasia; endometrial polyp; adenomyoma; endometrial intraepithelial neoplasia; EIN, endometrioid carcinoma, serous carcinoma; stromal carcinoma; leiomyoma; leiomyosarcoma; STUMP; endometrial stromal sarcoma; ovarium; fallopian tube; polycystic ovary syndrome; cyst; salpingitis; oophoritis; cystadenoma; borderline tumor; carcinoma; serous; mucinous; endometrioid; fibroma; thecoma; granulosa cell tumor; teratoma; Krukenberg tumor; pseudomyxoma peritonei.
- breast; mammary gland; polythelia; polymastia; amastia; hypoplasia of breast; macromastia; fat necrosis; breast infarct; puerperal mastitis; chronic mastitis; granulomatous mastitis; silicone mastitis; pseudoangiomatous stromal hyperplasia; myofibroblastoma; fibrocystic changes; FCD; adenosis; radial scar; ductal hyperplasia; fibroadenoma; phyllodes tumor; papilloma; adenomyoepithelioma; ductal carcinoma; carcinoma NST; lobular carcinoma; medullary carcinom; mucinous carcinoma; tubular carcinoma; papillocarcinoma; Paget carcinoma; gynecomastia.
- ectopic pregnancy; GEU; placenta; fetal membranes; umbilical cord; chorioamnionitis; vilitis; gestational trophoblastic disease; hydatidiform mole; choriocarcinoma; preeclampsia; amniotic fluid embolism; abortion; teratogen; fetal hydrops; newborn; prematurity; birth complications; asphyxia; hyaline membrane disease; bronchopulmonary dysplasia; retinopathy of prematurity; necrotizing enterocolitis; infection; hyperbilirubinemia; sudden infant death syndrome; SIDS.

Duration: 3 weeks (3 lectures + 1 practical)

**Topic 15: Pathology of endocrine system (Non-neoplastic diseases and tumors of the pituitary, thyroid gland, parathyroid glands, adrenals, endocrine pancreas, and epiphysis).**

Content: pituitary; thyroid gland; parathyroid glands; adrenals; pancreas; islets of Langerhans; epiphysis; hyperpituitarism; hypopituitarism; neurohypophyseal syndromes; pituitary adenoma; craniopharyngioma; goiter; thyrotoxicosis; hypothyroidism; cretinism; myxedema; Graves-Basedow; thyroiditis; follicular adenoma; follicular carcinoma; papillary carcinoma; medullary carcinoma; orphan Annie's eyes; hyperparathyroidism; hypoparathyroidism; pseudohypoparathyroidism; Recklinghausen; hypercortisolism; Cushing syndrome; hyperaldosteronism; adrenogenital syndrome; Waterhouse-Friderichsen syndrome; Addison disease; pheochromocytoma; paraganglioma; neuroblastoma; diabetes mellitus; metabolic syndrome; NET; NEC; pinealocytoma; pinealoblastoma; DNES; carcinoid syndrome; Zollinger-Ellison syndrome; MEN syndromes.

Duration: 1 week (1 lecture + 1 practical)

**Topic 16: Pathology of the nervous system and Pathology of the musculoskeletal system (Non-tumour diseases and tumours of the CNS, PNS, muscles; neurodegenerative diseases).**

Content: Congenital malformations of central nervous system. Cerebral edema, herniation, hydrocephalus. Mechanical injury of the central nervous system. Intracranial hemorrhage. Cerebrovascular diseases. Encephalomalacia, myelomalacia, global cerebral ischemia. Meningitis. Encephalitis. Slow viral infections and prion diseases of central nervous system. Degenerative diseases of CNS. Metabolic and nutritional diseases of nervous system. Tumors of central nervous system – general review, symptoms, prognosis. Glial tumors of CNS. Other (than glial) tumors of CNS. Tumors of meninges and peripheral nerves. (neural system; CNS; brain; spinal cord; peripheral nerves; global cerebral ischemia; respirator brain; stroke; ictus; intracerebral hemorrhage;

aneurysm; arteriovenous malformation; anencephaly; kraniorhachischisis; meningoencephalocele; spina bifida; Arnold-Chiari; Dandy-Walker; syringomyelia; syringobulbia; hydrocephalus; hydromyelia; cerebral edema; intracranial hypertension; cerebral herniation; epidural hemorrhage; subdural hemorrhage; subarachnoidal hemorrhage; contusion; diffuse axonal injury; meningitis; encephalitis; SSPE; PML; prions; Creutzfeldt-Jakob; kuru; BSE; dementia; Alzheimer; synucleinopathy; Parkinson; FTLT; tauopathy; Pick; ALS; Reye syndrome; Wernicke-Korsakoff; demyelination; multiple sclerosis; axonal degeneration; diabetic polyneuropathy; syndrom Guillain-Barré; ependymoma; astrocytoma; glioblastoma; oligodendroglioma; medulloblastoma; PNET; AT/RT; glioma; SEGA; von Hippel-Lindau; meningioma; SFT; neuroma; schwannoma; neurofibroma; neurofibromatosis).  
Duration: 1 week (1 lecture + 1 practical)

### **Topic 17: Pathology of the oral cavity**

Content: Necrotizing sialometaplasia; multifocal epithelial hyperplasia; oral melanoacanthoma; squamous cell papilloma; leukoplakia; erythroleukoplakia; lichenoid changes; low-grade and high-grade oral epithelial dysplasia; proliferative verrucous leukoplakia; submucosal fibrosis; HPV-associated oral epithelial dysplasia; oral squamous cell carcinoma; verrucous carcinoma; carcinoma cuniculatum; congenital granular cell epulis; granular cell epulis; ectomesenchymal chondromyxoid tumor; melanocytic tumor of infancy; mucocele; ranula; epulis  
Duration: 1 week (1 lecture)

### **Topic 18: Pathology of teeth and jaws. Odontogenic cysts and tumours.**

Content: Pseudotumors; odontogenic cysts; non-odontogenic cysts; radicular cyst; dentigerous cyst; eruptive cyst; calcifying odontogenic cyst; glandular odontogenic cyst; odontogenic keratocyst; adenomatoid odontogenic tumor; squamous cell odontogenic tumor; calcifying epithelial odontogenic tumor; ameloblastoma; odontoma; primordial odontogenic tumor; ameloblastic fibroma; dentinogenic ghost cell tumor; odontogenic fibroma; cementoblastoma; cemento-ossifying fibroma; odontogenic myxoma; sclerosing odontogenic carcinoma; ameloblastic carcinoma; clear cell odontogenic carcinoma; ghost cell odontogenic carcinoma; primary intraosseous NOS carcinoma; odontogenic carcinosarcoma; odontogenic sarcoma  
Duration: 1 week (1 lecture + 1 practical)

### **Topic 19: Fibrous and giant cell lesions of the craniofacial area. Cartilage and bone tumours of the head and neck.**

Content: cemento-osseous dysplasia; fibrous dysplasia; juvenile trabecular ossifying fibroma; psamatoid ossifying fibroma; familial gigantiform cementoma; osteoma; osteochondroma; osteoblastoma; chondroblastoma; chondromyxoid fibroma; desmoplastic fibroma of bone; osteosarcoma; chondrosarcoma; mesenchymal chondrosarcoma; rhabdomyosarcoma with *TFCP2* rearrangement  
Duration: 1 week (1 lecture)

### **Topic 20: Pathology of the skin of the head and neck**

Content: Skin anatomy; HPV-induced warts; verruca vulgaris; condyloma acuminatum; molluscum contagiosum; basal cell carcinoma; lentigo simplex; freckles; chloasma; melanocytic nevi; junctional; mixed; intradermal; blue nevus; halo nevus; nevus of Spitz; dysplastic nevus; congenital nevus; melanoma; immunohistochemistry, ABCDE rule; prognostic factors; genetic profile; therapy; adnexal tumors; apocrine; eccrine; sebaceous; follicular; pilomatrixoma; atheroma; epidemic cyst; trichilemmal cyst; seborrheic keratosis; trichoblastoma; trichilemmoma; trichofolliculoma; syringoma; poroma; hydradenoma; cylindroma; spiradenoma; adnexal malignancies  
Duration: 1 week (1 lecture + 1 practical)

### **Topic 21: Pathology of the salivary gland**

Content: Anatomy; inflammation; Sjogren's syndrome; sialoadenitis; pleomorphic adenoma; myoepithelioma; basal cell adenoma; Warthin's tumor; oncocytoma; tubular adenoma; ductal papillomas; lymphadenoma; sebaceous adenoma; adenoma from an embedded duct; adenoma from an annealed duct; sclerosing polycystic adenoma; keratocystoma; mucoepidermoid carcinoma; adenoid cystic carcinoma; acinic carcinoma; secretory carcinoma; microsecretory carcinoma; polymorphic adenocarcinoma; hyalinizing clear cell carcinoma; adenocarcinoma from basal cells; intraductal carcinoma; Salivary ductal carcinoma; myoepithelial carcinoma; epithelio-myoeplithelial carcinoma; mucinous adenocarcinoma; carcinosarcoma; lymphoepithelial carcinoma; sialoblastoma  
Duration: 1 week (1 lecture + 1 practical)

**Topic 22: Pseudotumours and soft tissue tumors of the head and neck. Pathology of the nose and sinonasal region**

Content: Mesoderm; mesenchyme; lipoma; hibernoma; liposarcoma; leiomyoma; STUMP; leiomyosarcoma; rhabdomyoma; rhabdomyosarcoma; nodular fasciitis; benign fibrous histiocytoma; fibromatosis; dermatofibrosarcoma protuberans; solitary fibrous tumor; fibrosarcoma; hemangioma; lymphangioma; glomus tumor; Kaposi's sarcoma; epithelioid hemangioendothelioma; angiosarcoma; PEComa; synovial sarcoma; Ewing's sarcoma; schwannoma; neurofibroma; perineurioma; malignant peripheral nerve sheath tumor; MPNST; respiratory epithelioid adenomatoid hamartoma; seromucinous hamartoma; nasal chondromesenchymal hamartoma; sinonasal papilloma; squamous cell carcinoma; NUT carcinoma; SWI/SNF complex-deficient sinonasal carcinoma; sinonasal undifferentiated carcinoma; teratocarcinosarcoma; HPV-associated multiphenotypic sinonasal carcinoma; sinonasal adenocarcinoma of intestinal and non-intestinal type; sinonasal angiofibroma; sinonasal glomangiopericytoma; biphenotypic sinonasal sarcoma; chordoma; sinonasal ameloblastoma; adamantinomatous craniopharyngioma; sinonasal meningioma; olfactory neuroblastoma

Duration: 1 week (1 lecture + 1 practical)

**Topic 23: Pathology of the eye and ear**

Content: Inflammations; hordeolum; chalazion; xerophthalmia; chemosis conjunctivae; conjunctivitis; keratomalacia; keratitis; uveitis; glaucoma; cataract; retinopathy angiosclerotica; squamous cell carcinoma; hemangioma; neurofibroma; nevi; melanoma; retinoblastoma; paraganglioma; lymphoma; lacrimal gland tumors; preauricular sinus; chondromalacia; chondrodermatitis nodularis chronica helices; granuloma; diffuse otitis externa; ceruminous adenoma; eccrine cylindroma; osteoma; cartilaginous exostosis; melanoma; adenoid cystic carcinoma; basalioma; lentigo maligna/melanoma; otitis media acuta; otitis media chronica; mastoiditis; benign acoustic neuroma; paraganglioma; cholesteatoma; Meniere's disease; Heffner's tumor - endolymphatic sac tumor

Duration: 1 week (1 lecture)