Doctoral School: **Biology Doctoral School**
Doctoral Program: Neuroscience and Human Biology

Subject code: **BIO/7/55**
Subject title: **Human growth and development L**
Teacher and Neptun code: **Dr. Zsákai Annamária (D5223E)**
Credits: 8
Class hours: 4 hours/week, lecture

Aim of the course
The lecture gives an overview on human development, especially fetal development. It also describes in detail the normal or pathological development of various organs and organ systems.
Course contents
Developmental biology: development, growth and maturation, growth velocity, factors influencing growth, influence of hormones on growth, heredity of intrauterine growth, external environmental factors, the influence of nutritional factors on growth, growth disorders, estimating the gestational age
Neonatal development, growth rhythm and the natural growth periods, morphological changes in developmental periods
Developmental abnormalities: deformities, causes and forms of the congenital abnormalities, frequencies of congenital abnormalities and factors influencing them, twinning, heredity and teratogenesis
Fertilization: morphology of fertilization, factors fostering fertilization, mono- and polyspermiosis, morula, gastrulation, placental biology, placentation types, foetal nutrition, the function of the placenta, hormonal correlation of the foetus and the mother, the immune system of the embryo
Genital organs: male genital organs, disorders of the spermatogenesis, female genital organs, disorders of the oogenesis
Fertilization: development of the oogenesis, implantation, trophoblast, yolk sac, amnion cavity, exocoeloma, extraembrional mesoderma, development of the mesoderma, early development of the nervous system, differentiation of the embryonic layers, chorda dorsalis, somita
Amnion cavity, liquor amnii, umbilical cord, placenta: decidua, chorion villi, structure of the placenta, placental circulation, the growth of the placenta, implantation types, placental abnormalities
The development of the skeletal system: ossification, development of the joints, ossificational abnormalities, the development of the vertebral column, chorda dorsalis, abnormal development, the development of the ribs and the sternum, the development of the skull, desmocranium, chondrocranium, chondrocranium-osteocranium, dermatocranium-osteocranium, viscero-cranium
Skeletal development of the extremities: skeletal development of the upper extremities, skeletal development of the lower extremities; muscular development, abnormal muscular development, movements during prenatal development
Blood, development of the vascular system, the development of the heart, developmental abnormalities, the development of the lymphatic system, developmental abnormalities of the lymphatic system, the development of the spleen
The development of the digestive apparatus: the development of the mouth, the cavitas nasi, face, the tongue, teeth, the pharynx, thyroid gland, thymus, glandula parathyreoidea, stomach, small intestine, the large intestine, the liver, abnormal development
The development of the respiratory apparatus: the development of the larynx, the trachea and bronchi, the pleurae, the lungs
The development of the urinary and generative organs: the development the kidneys, the ureters, the urinary bladder, abnormal development of the urinary and generative organs, sex determination, sex chromatin, intersexual status
The development of the nervous system: the development of the brain, cerebral ventricles, cortex, medulla spinalis, vegetative nervous system, adrenal glands, cranial and spinal nerves, meninges, abnormal development
Requirements
Written exam.
Course grade is the grade obtained at the exam.

Literature

Sadler, T.W. (1999) Langman Orvosi Embryologia. Medicina, Budapest.
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