Current information

Information for pregraduate students

- Study room and rental of bones
- Office hours
- Lending of dissection tools
- Vocabulary of anatomical terms
- Schemes from Czech Books frequently used in slide tests + description of schemes

© Institute of Anatomy
First year - General Medicine

General information
- General information, requirements for credits, practicals and dissections
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- Study room and rental of bones
- Schemes from Czech Books frequently used in slide tests
- Description of schemes

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- Schedule of practical trainings and seminars from anatomy for English taught students in winter semester 2016/2017
- Anatomical dissections in winter semester 2016/17

Summer semester
- Schedule of lectures from anatomy for English taught students in summer semester 2015/2016
- Schedule of practical trainings and seminars from anatomy for English taught students in summer semester 2015/16
- Anatomical dissections 2 in summer semester 2015/16
Compulsory Course of Anatomy for Students of General Medicine

Course Head: Prof. Karel Smetana, MD, DSc.
Head of English-taught courses: prof. David Sedmera, MD, DSc.
Curricular timing: Anatomy is taught mainly in the first and second semesters containing following parts: lectures (120 hrs), practical classes (60 hrs), seminars (30 hrs) and two dissection blocks (together 58 hrs). Advanced course of clinically oriented anatomy is taught in the beginning of winter semester of the 4th year (36 hrs). Total teaching hrs: 344.
Attendance to practical lessons and dissections is obligatory, attendance to lectures is recommended.
Content: macroscopic and microscopic anatomy of organs and organ systems, their development, regional anatomy with respect to functional and clinical applications. Neuroanatomy includes macro- and micro-scpic structure and pathways of the central nervous system.
**Lectures**: 4 hrs per week in each of semesters according to syllabus.

**First semester**: Anatomical terminology, locomotor apparatus including limbs, basic anatomical concept of vessels and nerves, central lymphatic organs, regional anatomy of limbs including their blood supply and innervation, gastrointestinal system and respiratory system including their blood supply and innervation.

**Second semester**: Urogenital system, heart, endocrine system, central and peripheral nervous system, regional anatomy of the head and neck, sensory organs, skin.

Attendance at lectures is recommended.

**Seventh semester** (*4th year*) clinically oriented topographical (regional) anatomy.
Practical classes/seminars: 3 hrs per week in the first and second semesters according to syllabus. The main goal is demonstration of organs, evaluation of students’ knowledge by means of written tests and oral examinations. Clinically relevant seminars are given by students themselves. Attendance is obligatory; first semester is closed by the credit, second semester by the credit and final exam, seventh semester by the credit with mark.

Gross anatomy dissection courses 1, 2: Courses are organized in the afternoon during both semesters according to syllabus and take together 58 hours. Attendance is obligatory; each dissection course is closed by the credit (oral examination, identification and description of dissected structures).

The goal of dissection is to dissect and learn all structures of the body and their topographical relations. Anatomic dissection 1 is focused on all anatomical limb structures and trunk muscles;
Requirements for successfully passing the Anatomy Course

1) The study of Anatomy 1, Anatomic Dissections 1, 2 are concluded by the credit, Anatomy 2 is concluded by credits. Anatomy 2 is concluded by the credit and final exam.

2) Requirements for receiving the credit
   a) **obligatory attendance** (absences must be substituted immediately as possible)
   b) **Knowledge** demonstrated during the practical classes, seminars and tests (this means, **that ALL the tests must be successfully passed**). Failed tests could be corrected according to agreement with the respective teachers; but no more than two re-tests are permitted.
   c) Credits: in case the credit has not been obtained at the end of a particular semester during the last practical of the semester or at the end of dissection course, the student is entitled to two re-examinations during examination period (written test - Anatomy 1, 2; oral test - Dissections)
3) **Prerequisites for the admission to the final exam:** credit from Anatomy 1 and Anatomy 2, credit from Anatomic Dissections 1 and 2.

4). **The final exam** is organized during summer examination period. It consists of three parts:

a) **written test**

b) **practical part:** dissection of selected region and demonstration of selected organs including their X-ray, MR and CT pictures

c) **theoretical part** based on the list of questions.

Satisfactory result of written test is prerequisite for the admission to other parts of the exam. The exam can be terminated at any part without even commencing the oral part and evaluates the student “failed”. This provision will not apply in case of a second re-examination, when the exam continues even in case of unsatisfactory result of the written test.

Successfully written test and practical part of the final exam is not necessary to retake in case of re-examination, they are valid during the whole exam period, however at longest for 4 months.
5) **Students with Individual Study Plan** are recommended to discuss the extent and schedule of the subject with the Head of the Institute (Prof. Smetana) at the beginning of particular semester.

6) For each examination (credit or exam), the students are always obliged to bring the University Study Report book (“Index”). Without this, no examination will be performed.
Anatomic Dissections 1 (B80617) for students of General Medicine

The course is held from December 8 (Thu) to December 15, 2016 (last day - credit test). Dissections are held from 14:30 to 17:45. Introductory lectures, held in the lecture hall from 14:30, explain the dissection steps and are constituent part of the course.

The goal of dissection is to learn the topography of limbs and thoracic and abdominal wall. During the course the students take turns in dissecting the above-mentioned regions.

Requirements for the credit:
a) full attendance and active participation on dissection,
b) successful final oral credit test – passing the test involves identification of all dissected structures.

Head of the course: Pavel Šnajdr, MD., Ph.D.

September 21, 2016

Prof. Karel Smetana, MD, DrSc.
**Recommended Textbooks**


Kahle, Frotscher: Color Atlas and Textbook of Human Anatomy. Vol. 3 Nervous System and Sensory Organs,

or Snell: Clinical Anatomy by systems, Lippincott Williams and Wilkins 2007

Josef Stingl, Miloš Grim, Rastislav Druga
Regional anatomy

Neuroanatomy: An Illustrated Colour Text, 4e
Alan R. Crossman, David Neary
Atlases
or
Agur, Dalley: Grant’s Atlas of Anatomy, Williams and Wilkins 2005
or Köpf-Maier: Wolf-Heidegger’s Atlas of Human Anatomy Vol.1+2, Karger 2001
or Sobotta: Atlas of Human Anatomy Vol.1+2, Williams and Wilkins 2000
Grant's Dissector, Williams and Wilkins 1999
http://uvi.lf1.cuni.cz/en
Web site was created to provide access to interactive study of anatomy. Images and videos stored on this site serve only as a supplement to classical literature, textbooks and scripts. The system allows you to search anatomical terms of Terminologia anatomica (TA) in the pictures and videos on the website and also allows you to choose the description in Latin or in English.

Anatomical illustrations, photos and videos are systematically arranged into sixteen categories of TA. References to those individual groups can be found on the left side of the page under link Organ systems.

The database contains over 7800 anatomical terms in Latin and English nomenclature. Terms can be found through the reference Terminologia anatomica on left side of the webpage. There are arranged again into sixteen basic groups as the anatomical nomenclature.
Corpus claviculae

Extremitas acromialis

Facies articularis acromialis

Extremitas sternalis

Facies articularis sternalis
# Schedule of Practices and Seminars - 1st semester 2016/2017

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Anatomical nomenclature. Upper limb skeleton I.</td>
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<tr>
<td>2.</td>
<td>Upper limb skeleton II. Skeleton of lower limb I.</td>
</tr>
<tr>
<td>3.</td>
<td>Skeleton of lower limb II. Joints and connections of upper limb. <strong>S1:</strong> Derivatives of germ layers, innervation and vessels of bones. Growth and healing of bones. Ossification of bones and bone age. <strong>Test 1:</strong> Introduction to organogenesis, General anatomy of bones and joints. <strong>Skeleton of upper limb.</strong></td>
</tr>
<tr>
<td>5.</td>
<td>Muscles, main vessels and nerves of the upper limb <strong>Test 3:</strong> Joints of extremities. <strong>S3:</strong> Innervation of muscle, muscular atrophy, varicose veins of lower extremity.</td>
</tr>
<tr>
<td>6.</td>
<td>Muscles, main vessels and nerves of the lower limb. <strong>S4:</strong> The vessels of extremities – palpation, pressure points, punctures; palsy of median, ulnar, radial and common peroneal nerves; limb defects.</td>
</tr>
<tr>
<td>7.</td>
<td>Vertebrae, costae, sternum, connections on vertebral column and thorax. Bones of the skull I. <strong>Test 4:</strong> Muscles of limbs, main vessels and nerves of limbs. <strong>S5:</strong> Bone marrow; curvatures of vertebral column; vertebral column and thoracic cage defects.</td>
</tr>
<tr>
<td>8.</td>
<td>Muscles of the thorax and abdomen. Inguinal canal. Muscles of the back. <strong>S6:</strong> diaphragm development and diaphragmatic hernias; inguinal hernias, femoral hernia; layers of the abdominal wall and its innervation and blood supply; ventral body wall defects.</td>
</tr>
<tr>
<td>9.</td>
<td>Bones of the skull. <strong>Test 5:</strong> Axial skeleton, muscles vessels and nerves of the trunk.</td>
</tr>
<tr>
<td>11.</td>
<td>Muscles and vessels of the head and neck. <strong>S8:</strong> The vessels of head and neck – palpation, pressure points, punctures. <strong>Test 6:</strong> The skull.</td>
</tr>
</tbody>
</table>
Objectives: to show importance of the anatomy in practice. Seminars are focused on the presentation of the anatomic background applied on selected clinical cases. (Diagnosis and treatment methods are not object of these presentations). It is recommended to discuss seminar lecture with course teacher. Form: spoken lecture performance (7 min maximum). Method: diagrams drawn on the board, power-point projection, back projection, videoprojection, practical demonstration of the specimens, X-ray pictures. Active participation in the seminars is one of the aspects to grant a semester credit.
Study room of bone specimens,
Open: Monday - Thursday
13:30 – 16:30h, **You need ID card**

Rental sets of bones to the home study is possible in these hours by our technicians (in the lobby of the Institute on the left). Only one box for each group. You need ID card.
Tuesday 13:00-16:00
Thursday 13:00-16:00
Friday 13:00-16:00

**Input code: practice, dissecting rooms - 1563**

protective footwear for dissection room, medical coat, disposable medical gloves, anatomical forceps
General terms

**Principal planes**

**Median plane** – the plane through the longitudinal axis, it divides the body into two almost equal halves

**Sagital plane** – any plane which is parallel to the median sagital plane

**Frontal (coronal) plane** – any plane which is parallel to the forehead and perpendicular to the sagital planes

**Transverse plane** – any plane which lie perpendicular to the sagital planes and to the coronal planes
Directions in space

- **Cranial** – toward the head
- **Caudal** – toward the buttocks
- **Superior** – upward
- **Inferior** – downward
- **Medial** – toward the middle, toward the median plane
- **Lateral** – away from the middle, away from the median plane
- **Medius** – in the middline
- **Median** – in the median plane
Directions in space

- **Anterior** – toward the front
- **Ventral** – toward the abdomen
- **Posterior** – toward the back
- **Dorsal** – toward the back
- **Proximal** – toward the trunk
- **Distal** – farther away from the trunk
Directions in space

- **Ulnar** – toward the ulna
- **Radial** – toward the radius
- **Tibial** - toward the tibia
- **Fibular** - toward the fibula
- **Palmar** – on the palm of the hand
- **Plantar** – on or toward the sole of the foot
Directions of movement

- **Flexion** – the act of bending
- **Extension** – the act of straightening
Directions of movement

- **Abduction** – movement away from the median plane
- **Adduction** – movement toward the median plane
- **Rotation** – movement around an axis
- **Circumduction** – circular movement
- **Pronation** – movement of forearm, rotation of the radius around the ulna – bones cross over each other
- **Supination** – bones lies parallel to one another
flexion/extension
pronation/supination
Bones are classified according to their shape

**Long bones** are tubular structures (e.g., humerus in the arm; phalanges in the fingers).

**Short bones** are cuboidal and are found in the ankle (tarsus) and wrist (carpus).

**Flat bones** usually serve protective functions (e.g., those of the cranium protect the brain).

**Irregular bones**, such as those in the face, have various shapes.
BONE MARKINGS

Bone markings appear wherever tendons, ligaments, and fascia are attached or where arteries or nerves lie adjacent to bones. Other formations occur in relation to the passage of a tendon (often to direct the tendon or improve its leverage) or to control the type of movement occurring at a joint.

**Condyle**: rounded articular area (e.g., condyles of the femur). Peripheral part of long bone with

**Epicondyle**: eminence superior to a condyle (e.g., epicondyles of the humerus).

**Crest**: ridge of bone (e.g., iliac crest).

**Facet**: smooth flat area, usually covered with cartilage, where a bone articulates with another bone (e.g., articular facets of a vertebra).

**Foramen**: passage through a bone (e.g., obturator foramen).

**Fossa**: hollow or depressed area (e.g., infraspinous fossa of the scapula).

**Line (linea)**: linear elevation (e.g., soleal line of the tibia).
BONE MARKINGS

**Malleolus**: rounded prominence (e.g., lateral malleolus of the fibula).

**Notch**: indentation at the edge of a bone (e.g., greater sciatic notch in the posterior border of the hip bone).

**Process**: projecting spine-like part (e.g., spinous process of a vertebra).

**Protuberance**: projection of bone (e.g., external occipital protuberance of the cranium).

**Spine**: thorn-like process (e.g., spine of the scapula).

**Trochanter**: large blunt elevation (e.g., greater trochanter of the femur).

**Tubercle**: small raised eminence (e.g., greater tubercle of the humerus).

**Tuberosity**: large, rounded elevation (e.g., ischial tuberosity, calcaneal tuberosity).
VASCULATURE AND INNERVATION OF BONES
Bones are richly supplied with blood vessels. The arterial supply is from:
Nutrient arteries (one or more per bone) that arise outside the periosteum, pass through the shaft of a long bone via nutrient foramina, and split in the medullary cavity into longitudinal branches. These vessels supply the bone marrow, spongy bone, and deeper portions of the compact bone.
Small branches from the periosteal arteries of the periosteum supply most of the compact bone. Consequently, if the periosteum is removed, the bone will die.
Metaphysial and epiphysial arteries supply the ends of the bones. These vessels arise mainly from the arteries that supply the joints.
Bones of upper limb

shoulder girdle
(scapula, clavicle)
+
free upper limb
(humerus, ulna, radius
carpal + metacarpal
bones + phalanx)
Clavicle – collar bone

- Acromial facet (articular surface)
- Impression for costoclavicular ligament
- Trapezoid line
- Conoid tubercle
- Spine of scapula
- Acromial angle
- Acromioclavicular joint
- Impression of pectoralis major
- Acromion
- Superior angle
- Supraspinous fossa
- Manubrium of sternum
- Sternal end
- Clavicle
- Sternum
- Coracoid process
- Acromioclavicular joint
- Sterno-clavicular joint

Tuberosity for coracoclavicular ligament
Scapula

- Medial, lateral and superior margin
- Superior, inferior and lateral angle
- Anterior or costal surface
- Posterior surface – spine of scapula – supraspinous and infraspinous fossa
- Acromion – articular facet for clavicle
Scapula

- Glenoid cavity
- **Supraglenoid tubercle** – site of origin of long head of biceps
- **Infraglenoid tubercle** - site of origin of long head of triceps
- **Coracoid process** - site of origin of pectoralis minor, coracobrachialis and short head of biceps
Head of humerus – anatomical neck
Greater tubercle
Lesser tubercle
Intertubercular groove - bicipital groove
Crest of greater tubercle
Crest of lesser tubercle
Surgical neck
Body of humerus
Groove for radial nerve
Deltoid tuberosity
Medial margin
Medial supracondylar ridge
Lateral margin
Lateral supracondylar ridge
Condyle of humerus
1 scapula  2 scapular spine  3 clavicle
4 acromion process  5 glenoid fossa
6 coracoid process  7 humerus
8 anatomical neck of humerus
9 greater tuberosity
10 lesser tuberosity
11 surgical neck of humerus
A coracoclavicular joint
B acromioclavicular joint
C glenohumeral joint
Condyle of humerus
   trochlea of humerus
   Coronoid fossa

   capitulum
   radial fossa

Medial and lateral epicondyle

Groove for ulnar nerve
- **Interosseous membrane**

- **Distal radio-ulnar joint**
  - head of ulna-
  - ulnar notch of R

compound together with prox. R-U joint
Elbow joint – complex of 3 articulations

**humeroulnar joint**: trochlea of humerus – trochlear notch

**humeroradial joint**: capitulum – radial articular fovea/facet,

**proximal radioulnar joint**: radial notch – articular circumference of the head of R
Radius

Head
  Articular facet
  Articular circumference

Neck

Shaft; Body
  Radial tuberosity
  Anterior surface
  Posterior surface
  Lateral surface
  Interosseus border

Radial styloid process
  Dorsal tubercle
  Groove for extensor muscle tendons
  Ulnar notch

Carpal articular surface
**Ulna**

Olecranon
Coronoid process
Tuberosity of ulna
Radial notch
Trochlear notch

**Shaft; Body**

Anterior surface
Posterior surface
Medial surface
Interosseus border
Anterior border
Posterior border
Supinator crest

**Head**

Articular circumference
Ulnar styloid process
http://anat.lf1.cuni.cz/group55.html

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