Course Speciﬁcations

Course title: Human Anatomy and Embryology (2nd year)

(Code): ANA-201

• Department offering the course: Anatomy Department
• First academic year of M.B B.Ch. program
• Date of speciﬁcation approval: 2016

A- Basic Information

• Allocated marks: 250 marks
• Course duration: 30 weeks
• Teaching hours: 240 hours
  • Theoretical: 120 hours
  • Practical: 120 hours

B- Professional Information

1- Overall Aim of the Course:

• To provide a core body of scientiﬁc knowledge concerning the normal structure of the human body at the level of organ and organ system with the study of the normal growth and development relevant to anatomical topics.
• To provide appropriate ethical and professional education necessary for dealing with cadavers.
• To correlate anatomical facts with their clinical applications.

2- Intended Learning Outcomes (ILOs):

a- Knowledge and Understanding

By the end of the course, students should be able to:

1. Describe the basic principles of structure of the different tissues, organs and systems of the human body (a.1).
2. Point out the surface landmarks of the underlying bones, muscles and tendons, and internal structures (main nerves, vessels and viscera) (a.1).
3. Outline major clinical applications of anatomical facts (a.1).
4. Explain the different stages of human development, evolution and growth (a.3).
5. Describe the theoretical basis of professional, practical skills and evidence based medicine (EBM) (a.8).

**Professional skills: (b, c, d, and e)**

**b- Practical and Clinical Skills**

*By the end of the course, students should be able to:*

1. Apply the anatomical facts while examining the living subject in order to reach a proper diagnosis (b.1).

**c- Professional Attitude and Behavioral Skills**

*By the end of the course, students should be able to:*

1. Apply the national code of ethics issued by the Egyptian Medical Syndicate (c.5).
2. Respect and follow the institutional code of conduct (c.6).

**d- Communication Skills**

*By the end of the course, students should be able to:*

1. Value the ethics and respect to all individuals inside and outside the dissecting room and pay a good deal of respect to the cadavers (d.2).
2. Maintain honesty and integrity in all interactions with teachers, colleagues, patients and others with whom physicians must interact in their professional lives (d.5).
3. Recognize the scope and limits of their role as students as well as the necessity to seek and apply collaboration with other workers (d.5).
4. Be responsible towards work (d.5).
5. Maintain a professional image concerning behavior, dress and speech (d.5).

**e- Intellectual skills**

*By the end of the course, students should be able to:*

1. Integrate the basic anatomical facts with clinical data (e.1).
2. Identify the different surface markings and determine the position or course of internal structures (e.1).
3. Identify the preserved specimens (e.1).
4. Interpret the different internal structures in cadavers and normal anatomical structures on radiographs and ultrasonography, C.T. scan and nuclear magnetic resonance images (e.1).
5. Interpret some clinical findings in relation to developmental basis (e.1).
6. Design scientific research through the formulation of research questions pertinent to medicine and the collection, analysis and interpretation of medical data (e.7).
f- **General and transferable skills**

By the end of the course, students should be able to:

1. Adopt the principles of lifelong learning needs of the medical profession (continuous professional development; CPD) (f.1).
2. Use computers efficiently in reaching biomedical information to remain current with advances in knowledge and practice (f.2).
3. Present information clearly in written, electronic and verbal forms (f.3).
4. Communicate ideas and arguments effectively (f.4).
5. Work effectively within a multidisciplinary team (f.5).

3- **Course contents:**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Lectures (hrs)</th>
<th>Tutorial / Small group discussion (hrs)</th>
<th>Practical (hrs)</th>
<th>Total (hrs)</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Head and neck</td>
<td>43</td>
<td>10</td>
<td>40</td>
<td>93</td>
<td>38.75</td>
</tr>
<tr>
<td>2- Neuroanatomy</td>
<td>21</td>
<td>6</td>
<td>22</td>
<td>49</td>
<td>20.4</td>
</tr>
<tr>
<td>3- Abdomen &amp; Pelvis</td>
<td>35</td>
<td>8</td>
<td>34</td>
<td>77</td>
<td>32.1</td>
</tr>
<tr>
<td>4- Special Embryology</td>
<td>21</td>
<td>-----------------</td>
<td>---------------</td>
<td>21</td>
<td>8.75</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>120</td>
<td>24</td>
<td>96</td>
<td>240</td>
<td>100</td>
</tr>
</tbody>
</table>

**Topics**

A) **Lectures**

1- **Head and Neck**

- Skull (features, structures passing through skull foramina, sex differences, age determination)
- Mandible (features, sex and age differences)
- Cervical vertebrae (features of typical and atypical vertebrae)
- Hyoid bone
- Scalp (layers, blood and Nerve Supply)
- Face (muscles, blood and Nerve supply)
- Parotid (position, features, blood and nerve supply)
- Infratemporal fossa (boundaries, contents)
- Tempromandibular joint (type, structures, movements, nerve supply)
- Intracranial cavity (dural folds, sinuses, intracranial course of cranial nerves, emissary veins, intracranial part of ICA)
- Orbit (boundaries, extraocular muscles, nerves, vessels, lacrimal apparatus)
Posterior triangle of Neck (boundaries and contents)
Anterior triangle (boundaries and divisions: 1- submandibular: boundaries and contents 2- carotid triangle: boundaries and contents 3- muscular triangle: boundaries and contents)
Thyroid gland (position, shape, relation, blood and nerve supply)
Cervical part of esophagus and trachea (beginning and termination in the neck, relation, blood and nerve supply)
Carotid arteries (beginning, termination, course, relations and branches)
Jugular veins (formation, termination, relations, tributaries)
Root of the Neck (great vessels, muscles)
Cranial nerves (course, relations and distribution)
Cervical plexus (position, formation, branches)
Cervical part of sympathetic chain (position and related ganglia)
Tongue (parts, muscles, blood and nerve supply and lymphatic drainage)
Soft palate (muscles, blood and nerve supply and lymphatic drainage)
Pharynx (parts, features, muscles, muscles, blood and nerve supply and lymphatic drainage)
Nose (boundaries, features of the lateral wall)
Paranasal sinuses (position, relations, drainage, nerve supply).
Larynx (cartilage, membranes, ligaments, muscles, features of the inlet and interior of larynx, blood and nerve supply and lymphatic drainage)
Ear (parts, communications, contained structures, relations)
Lymphatic drainage of the head and neck

II- Neuroanatomy

Forebrain (A- cerebral hemisphere: external features, surfaces, borders, lobes, sulci & gyri, functional areas, basal nuclei, white matter of cerebral hemisphere,. B- Diencephalon: position, relation, communication and function of its different parts)
Lateral ventricle (position parts, boundaries, relation, communication)
Third ventricle (position, boundaries, communication, recesses)
Midbrain (position, external features, cranial nerves attached to it and the location of their internal nuclei)
Hind brain (external features of pons and medulla and the cranial nerve attached to the with the internal location of their nuclei. External features of the cerebellum, its functional and anatomical divisions, its cerebellar peduncels and their connection with the types of fibers passing in each of them)
Fourth ventricle (position, boundaries, communication and recesses)
Cerebral meninges (their features, positions of the different subarachnoid cisterns)
Cerebro-spinal fluid (sites of production, circulation, drainage, possible sites of obstruction of its flow)
Base of the brain (Define the site, boundaries and contents of the interpeduncular fossa. formation, site and clinical importance of the circle of wills)
Arterial supply of the brain (origin, course and distribution of the arteries of the brain: anterior cerebral, middle cerebral, Posterior cerebral, basilar, 4th part of the vertebral).
Cerebral veins (sites and draining areas of the veins of the brain)
Gross anatomy of the spinal cord (external features of the spinal cord, spinal nerve roots, cauda equine and internal features of the spinal cord)
Spinal meninges
• Pyramidal and extrapyramidal tracts (origin, course, termination and function of the pyramidal tract, origin, course, termination and functions of the different extrapyramidal tracts and the differences between pyramidal and extrapyramidal tracts.
• Sensory pathways (origin, course, termination and functions of proprioception, touch, pain & temperature, visual pathway, auditory pathway and olfactory pathway)

III- Abdomen and Pelvis

• Anterior abdominal wall (layers of the abdominal wall, characters of the abdominal fascia, origin, insertion, direction of fibers, nerve supply and action of the muscles of the anterior abdominal wall, the structures related to the abdominal muscles, formation and contents of the rectus sheath and arteries, veins, nerves and lymphatics of the anterior abdominal wall)
• Inguinal region (the site, direction, ends, boundaries and contents of the inguinal canal)
• Scrotum and testis (external features and structure of the testis and epididymis, coverings of the testis and blood and nerve supply of the scrotum and testis)
• Planes and regions of abdominal cavity
• Peritoneum (layers and arrangement of the peritoneum, compartments of the peritoneal cavity and their subdivisions, position and boundaries of the lesser sac and epiploic foramen, peritoneal recesses and peritoneal folds: site, attachments and contents)
• Alimentary canal (gross anatomy of the abdominal esophagus, stomach, small intestine and large intestine including position, shape, parts, peritoneal covering, relations, blood supply, nerve, lymphatic drainage and surface anatomy).
• Vessels of the gut (origin, course relations and branches)
• Spleen (position, features, peritoneal covering and folds, relations, blood supply and its surface projection)
• liver and biliary system (position, lobes, peritoneal folds and ligaments, relations and blood supply of the liver. Position, parts, relations, blood and nerve supply of the gall bladder, features of the intrahepatic and extrahepatic biliary passages. Surface projections of the liver and gall bladder)
• pancreas (position, parts, peritoneal covering, relations, ducts, blood supply and surface projection)
• kidneys, abdominal part of ureter and suprarenal glands (position, fascial and peritoneal coverings, relations and blood supply of the kidney and suprarenal glands. Course, relations, sites of constriction, blood supply and nerve supply of the abdominal part of the ureter)
• Posterior abdominal wall (beginning, end, course, relations and branches of the abdominal aorta, beginning, end, course, relations and tributaries of the inferior vena cava, sites and drainage areas of abdominal lymph nodes. Formation, position and drainage areas of the cisterna chilii, formation and branches of the lumbar plexus, lumbar sympathetic chain and autonomic nerve plexuses in the abdomen)
• Diaphragm (origin, insertion, nerve supply, action, relations and openings)
• Muscles of the posterior abdominal wall
• Thoracolumbar fascia
• bony pelvis (features and sex differences)
• muscles and joints of the pelvis
• Nerves and vessels of pelvis (formation and branches of the sacral plexus, formation and distribution of the autonomic plexuses in the pelvis, origin, course, relations and branches of the internal iliac artery)
- Pelvic viscera (gross morphology of the rectum, urinary bladder, ureters, urethra, male and female internal genital organs: peritoneal covering, parts, relations, blood supply, nerve supply and lymphatic drainage)
- perineum (boundaries and division)
- Anal triangle (the walls and contents of the ischiorectal fossa)
- Urogenital triangle (boundaries and contents of the superficial and deep perineal pouches)
- External genitalia in male and female (the parts, blood and nerve supply of male and female external genitalia)

IV- **Special Embryology**

- Development of the heart
- Development of arteries
- Development of veins
- Fetal circulation
- Development of the Pharyngeal arches and the associated structures
- Development of the Face, nose, palate and mouth
- Development of the gastrointestinal tract
- Development of body cavities
- Development of the urinary system
- Development of the genital system
- Development of the endocrine glands
- Development of the Integumentary system
- Development of the skeletal system

B) **Tutorial / Small Group Discussions**

1. **Head and Neck:** discussion of the practical topics, before and after the practical classes.
2. **Neuroanatomy:** discussion of the practical topics, before and after the practical classes.
3. **Abdomen and Pelvis:** discussion of the practical topics, before and after the practical classes.

C) **Practical Classes:** The practical classes include the following topics:

1. **Head and Neck:**
   - Skull and Mandible
   - Cervical vertebrae
   - Scalp and face
   - Parotid gland
   - Infratemporal fossa and muscles of mastication
   - Intracranial cavity and the orbit
   - Posterior triangle of Neck
   - Anterior triangle (1- submandibular  2- carotid triangle 3- muscular triangle)
   - Thyroid gland
   - Cervical part of esophagus and trachea
   - Carotid arteries and Jugular veins
   - Root of the Neck (great vessels, muscles)
   - Cranial nerves
   - Cervical plexus
   - Cervical part of sympathetic chain
- Tongue (sagittal section)
- Soft palate (sagittal section)
- Pharynx (sagittal section)
- Nose and paranasal sinuses (sagittal section)
- Larynx (sagittal section)

2- Neuroanatomy:

- Forebrain (A- cerebral hemisphere: external features, surfaces, borders, lobes, sulci & gyri, functional areas, basal nuclei, white matter of cerebral hemisphere,. B- Diencephalon: position and different parts)
- Lateral ventricle
- Sagittal section of the brain
- Horizontal section of the brain
- Arterial supply of the brain
- Base of the brain and interpeduncular fossa
- Hind brain (external features of pons and medulla and the cranial nearve attached to the with the internal location of their nuclei. External features of the cerebellum, its cerebellar peduncels and their connection)
- Fourth ventricle (position, boundaries, communication, opening and recesses)

3- Abdomen and Pelvis

- Anterior abdominal wall (layers of the abdominal wall, the muscles of the anterior abdominal wall and the rectus sheath)
- Inguinal region (the site, direction, ends, boundaries and contents of the inguinal canal)
- Scrotum and testis (external features and structure of the testis and epididymis, coverings of the testis)
- Peritoneum (layers and arrangement of the peritoneum, compartments of the peritoneal cavity and their subdivisions, position and boundaries of the lesser sac and epiploic foramen, peritoneal recesses and peritoneal folds)
- Alimentary canal (abdominal esophagus, stomach, small intestine and large intestine)
- Vessels of the gut
- Spleen (position, features, peritoneal covering and folds, relations, and its surface projection)
- Liver (position, lobes, peritoneal folds and ligaments, relations of the liver.)
- pancreas (position, parts, peritoneal covering, relations, ducts and surface projection)
- kidneys, abdominal part of the ureter and suprarenal glands (position, fascial and peritoneal coverings and relations of the kidney and suprarenal glands. Course, relations and sites of constrictions abdominal part of the ureter)
- Posterior abdominal wall
- Diaphragm
- Muscles of the posterior abdominal wall
- Thoracolumbar fascia
- bony pelvis (features and sex differences)
- Nerves and vessels of pelvis
- Rectum, urinary bladder, ureters,
- Urethra, male and female internal genital organs)
- Ischiorectal fossa
• Urogenital triangle (boundaries and contents of the superficial and deep perineal pouches)
• External genitalia in male and female

4- Teaching and learning methods

Methods Used:
• Lectures
• Practical classes including: practical dissection, demonstration in the dissecting room, museum jars and radiological films.
• Tutorial classes

Teaching plan:
• Lectures:
  Student are divided into five groups
  One hour lecture, four times every week
  Time of the lecture is from 8:00 - 9:00 am, 9:00-10:00 am, and 10:00-11:00 am, for the different groups (According to the Faculty Central Schedules)
• Tutorials:
  Half an hour session, two times every week, Students are divided into groups of 130-150 and are given a prelab discussion for half an hour, before the beginning of each practical class using data show and videos to demonstrate the important structures of the dissected region(s) of the topic of the week which the student should focus on during the practical classes. In addition, a brief topic discussion and a discussion of the related problem solving questions are done by the end of the practical classes. X-ray images are also demonstrated. There are group discussion and formative assessment questions every session.

• Practical classes:
  Two hours session, two times every week, held in the dissecting room. The students divided into 12 subgroups (18-22 students/dissected body). The demonstrators are responsible for demonstration of the different structures of the dissected region, on cadavers, plastinated and plastic specimens, to the students and helping them to recognize these structures.
Time plan:

<table>
<thead>
<tr>
<th>Item</th>
<th>Time schedule</th>
<th>Teaching hours</th>
<th>Total hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>One hour each between 8:00 and 11:00 am</td>
<td>5 hours/week (24 weeks)</td>
<td>120</td>
</tr>
<tr>
<td>Practical</td>
<td>Two hours session two times/ week</td>
<td>4 hours/week (24 weeks)</td>
<td>96</td>
</tr>
<tr>
<td>Tutorial</td>
<td>Half hour session two times / week</td>
<td>One hour/week (24 weeks)</td>
<td>24</td>
</tr>
<tr>
<td>Revisions and Training on Exams</td>
<td>Two weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>240</td>
</tr>
</tbody>
</table>

5- Students Assessment methods

5-A) Attendance criteria: The Faculty Bylaws

5-B) Assessment tools:

<table>
<thead>
<tr>
<th>Tool</th>
<th>(ILOs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written examination</td>
<td>To assess knowledge and Understanding and Intellectual skills</td>
</tr>
<tr>
<td>Practical examination (OSPE) + Oral Exam</td>
<td>To assess Practical, transferable and Intellectual skills</td>
</tr>
<tr>
<td>Assignment</td>
<td>To assess General and transferable skills</td>
</tr>
</tbody>
</table>

5-C) Time schedule: Faculty bylaws

<table>
<thead>
<tr>
<th>Exam</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Quiz exam</td>
<td>Not predetermined</td>
</tr>
<tr>
<td>2- First half of the academic year</td>
<td>Held in 7th week</td>
</tr>
<tr>
<td>3- Mid-year exam</td>
<td>Held in 14th and 15th weeks</td>
</tr>
<tr>
<td>4- Second half of the academic year</td>
<td>Held in 24th to 26th weeks including revisions</td>
</tr>
<tr>
<td>5- Final Practical exam (OSPE)+ Oral exam</td>
<td>Held in 28th week</td>
</tr>
<tr>
<td>6- Final written exam</td>
<td>Held in 30th week</td>
</tr>
</tbody>
</table>
5-D) Grading System:

<table>
<thead>
<tr>
<th>Examination</th>
<th>Marks allocated</th>
<th>% of Total Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Continuous assessment +</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Midterm exams</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>2- Mid-year written exam</td>
<td>35</td>
<td>14</td>
</tr>
<tr>
<td>3- Final exam:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a- Written</td>
<td>125</td>
<td>80</td>
</tr>
<tr>
<td>b- Practical (OSPE) + Oral exam</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>250</td>
<td>100</td>
</tr>
</tbody>
</table>

Formative assessment:
Feedback is given to student after the Formative exams.

5-E) Examination description:

<table>
<thead>
<tr>
<th>Examination</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-continuous assessment + Midterm</td>
<td>Quiz exam, practical notebook, Projects, researches, two spotting exams</td>
</tr>
<tr>
<td>exams</td>
<td></td>
</tr>
<tr>
<td>2- Mid-year written exam</td>
<td>Written exam: short essay, MCQ, case scenario</td>
</tr>
<tr>
<td>3- Final exam:</td>
<td>Written: essay question including Head and Neck, Neuroanatomy, Abdomen and Pelvis and Special embryology, MCQ, case scenario, Problem solving &amp; applied anatomy, matching questions and filling in the space Practical (OSPE): Including: bone, soft tissues and imaging anatomy Oral: one committee</td>
</tr>
<tr>
<td>a- Written</td>
<td></td>
</tr>
<tr>
<td>b- Practical (OSPE) + Oral exam</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6 exams</td>
</tr>
</tbody>
</table>

6- List of references:
1- Course notes: Books authorized by department.
2- Essential Books:
a) Cunningham’s Anatomy
b) Gray’s Anatomy for students

7- Facilities required for teaching and learning:
Facilities used for teaching this course include:
- Lecture halls: 5 lectures halls
- Small group classes
- Laboratory (dissecting rooms)
- Data show and lap tops
- Plastinated and Plastic models
- Anatomy Museum

Course coordinator: Professor Ehab El-Shaarawy

Head of Department: Professor Hoda El-Aasar

Date: 9 / 8 / 2016