### Supplementary material 1. Characterization of the compulsory (IMED2202) and the optional (IMED2283) anatomy courses (UWA, 2011).

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Compulsory unit 7 points: IMED2202 “Normal systems”</th>
<th>“Option unit” 6 points: IMED2283 Dissection course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrolment, year of medical school</td>
<td>Compulsory, 2nd year</td>
<td>Optional, self-selected, on a “first come-first serve basis” in parallel to IMED2202.</td>
</tr>
<tr>
<td>Attendees</td>
<td>All 170 students, including attendees of IMED2283. The other 2/3 of IMED2202 choosing option units (covering physiology, or biochemistry) either during 1st (paralleling IMED2201) or 2nd (paralleling IMED2202) semester</td>
<td>54 students doing the option unit in the 2nd semester in parallel to IMED2202</td>
</tr>
<tr>
<td>Duration</td>
<td>13 weeks</td>
<td>13 weeks</td>
</tr>
</tbody>
</table>
| Preceding courses (1st year, 2nd year, 1st semester)      | **Level 1, 1st semester:**
IMED1106                                             | Foundations of animal and human biology (4 points) |
IMED1107                                             | Foundations of medical chemistry (3 points)         |
|                                                        | **Option (including physics) (6 points)***          |
|                                                        | **Personal and professional development (PPD) unit, online modules*** |
|                                                        | **Level 1, 2nd semester:**                           |
IMED1100                                             | Normal systems (Cardiovascular and respiratory system) (12 points) |
|                                                        | **Level 1, Full year:**                              |
IMED1113/IMED1114                                    | Molecules, genes and cells Part 1 and 2 (9 points)  |
IMED 1111/IMED1112                                    | Foundations of clinical practice (Problem-based, Doctor, Health and Society, Doctor and Patient) Parts 1 and 2 (14 points) |
|                                                        | **Level 2, 1st semester:**                           |
IMED2201                                             | Normal systems (Digestive, endocrine and urogenital systems) (7 points) |
|                                                        | **Level 2, Full Year:**                              |
IMED2231/IMED2232                                    | Normal systems Part 1, 2 (14 points): preparation for final exam (NS200) |
IMED2211/IMED2212                                    | Foundations of clinical practice (Problem-based, Doctor and patient) Part 1, 2 (14 points) |
|                                                        | **During Level 1 or 2:**                             |
|                                                        | Short time placement in a community based clinical environment within the Metropolitan area |

Previous or parallel (2nd year 2nd semester, in italics) courses:

- Level 1, 1st semester:
  - IMED1106: Foundations of animal and human biology (4 points)
  - IMED1107: Foundations of medical chemistry (3 points)
  - Option (including physics) (6 points)
  - Personal and professional development (PPD) unit, online modules

- Level 1, 2nd semester:
  - IMED1100: Normal systems (Cardiovascular and respiratory system) (12 points)

- Level 1, Full year:
  - IMED1113/IMED1114: Molecules, genes and cells Part 1 and 2 (9 points)
  - IMED1111/IMED1112: Foundations of clinical practice (Problem-based, Doctor, Health and Society, Doctor and Patient) Parts 1 and 2 (14 points)

- Level 2, 1st semester:
  - IMED2201: Normal systems (Digestive, endocrine and urogenital systems) (7 points)

- Level 2, Full Year:
  - IMED2231/IMED2232: Normal systems Part 1, 2 (14 points): preparation for final exam (NS200)
  - IMED2211/IMED2212: Foundations of clinical practice (Problem-based, Doctor and patient) Part 1, 2 (14 points)

- During Level 1 or 2:
  - Short time placement in a community based clinical environment within the Metropolitan area
| Course structure | Theoretical lectures Tuesday-Friday  
45 minutes, held by faculty:  
44 lectures of anatomy, 16 of physiology, 3 of biochemistry, 4 of physics, 3 unit coordination/feedback | Theoretical tutorials Tuesday and Wednesday  
45 min, held by student teams:  
24 anatomy plenary lectures, clinical problem-based |
| | Practical course  
laboratory sessions of 2 hours/group, divided into 2 groups: 20 anatomy sessions, 11 neuroanatomy and head/neck sessions, additional physiology and neurophysiology sessions | Practical course  
practical cadaver dissection sessions of 2 hours, all students: topographical aspects (25 Monday and Tuesday sessions, 50 hours in total), see Supplementary material 2 |
| | Friday clinical anatomy tutorials  
1 hour/group, divided into 2 groups: student presentations, 31 issues, covering anatomy and clinical application | Tutor-guided, self-directed learning |

| Course contents | Muskuloskeletal system (15 hours anatomy, 4 hours physiology, 3 hours biochemistry, 4 hours physics), Nervous system (22 hours anatomy, 12 hours physiology), Head and neck (7 hours anatomy)  
(Lecture topics, see Supplementary material 3) | Head and neck topography (50 hours)  
Thorax and back topography (50 hours)  
Abdominal and gluteal topography (50 hours)  
Upper limb topography (50 hours)  
Lower limb topography (50 hours) |

| Teaching modalities | Prosections  
Faculty-supervised regional dissections presented as poster  
Anatomical models  
Radiographic images  
Teaching material, book recommendations on the Learning Management System WebCT | Problem-based student lectures (with instructions)  
Faculty-supervised dissection  
Written dissection manual  
Course web site (Filgueira and Groscurth, 2010)  
Documentary film “Donated to Science” |

| In-course assessments | Continuous assessments  
CA1 after 4 weeks  
CA2 after 8 weeks  
CA3 after end of the course (practical assessment) | Readiness assurance tests  
Discussion and agreement on dissection result  
Peer- and teacher assessment of group presentation  
Final multiple choice question exam |

| Assessment/examination covering the first 2 years (all 2nd year students) | Final integrated examination NS200 (IMED2232) covering all contents from the first 2 years (anatomy, histology, physiology, biochemistry) |  |
Supplementary material 2.

Time schedule of topographical regions of the dissection program, Monday, 10 a.m. to 12 noon, and Tuesday 11 a.m. to 1 p.m. MCQ: multiple choice question.

<table>
<thead>
<tr>
<th>Week</th>
<th>Session</th>
<th>Head and Neck</th>
<th>Thorax and Back</th>
<th>Abdomen and Gluteal Region</th>
<th>Arm and Hand</th>
<th>Leg and Foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Monday</td>
<td>Introduction</td>
<td>Introduction</td>
<td>Introduction</td>
<td>Introduction</td>
<td>Introduction</td>
</tr>
<tr>
<td></td>
<td>Tuesday</td>
<td>Neck skin</td>
<td>Thorax skin</td>
<td>Abdomen skin</td>
<td>Cubital region skin</td>
<td>Anterior thigh skin</td>
</tr>
<tr>
<td>2</td>
<td>Monday</td>
<td>Head and neck subcutaneous layer</td>
<td>Thorax subcutaneous layer, deltid-pectoral triangle</td>
<td>Abdomen, inguinal region subcutaneous layer</td>
<td>Cubital region subcutaneous layer</td>
<td>Anterior thigh subcutaneous layer</td>
</tr>
<tr>
<td></td>
<td>Tuesday</td>
<td>Posterior triangle of the neck</td>
<td>Axillary region</td>
<td>Abdominal wall muscles and fascia</td>
<td>Cubital region muscles and tendons</td>
<td>Anterior thigh superficial fascial and muscle layer</td>
</tr>
<tr>
<td>3</td>
<td>Monday</td>
<td>Carotid triangle of the neck</td>
<td>Axillary region</td>
<td>Blood supply sup. mesenteric artery/vein</td>
<td>Cubital region supply structures</td>
<td>Femoral triangle</td>
</tr>
<tr>
<td></td>
<td>Tuesday</td>
<td>Muscular triangle of the neck</td>
<td>Internal layer thorax and abdominal wall</td>
<td>Blood supply sup. mesenteric artery/vein</td>
<td>Ventral forearm skin</td>
<td>Anterior thigh deep layer</td>
</tr>
<tr>
<td>4</td>
<td>Monday</td>
<td>Submental and submandibular triangles</td>
<td>Anterior mediastinum</td>
<td>Blood supply inf. mesenteric artery/vein</td>
<td>Ventral forearm subcutaneous layer</td>
<td>Knee skin and subcutaneous layer</td>
</tr>
<tr>
<td></td>
<td>Tuesday</td>
<td>Sternocleidomastoid region</td>
<td>Heart</td>
<td>Blood supply coeliac trunk and portal area</td>
<td>Ventral forearm muscles</td>
<td>Knee joint</td>
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<tr>
<td>5</td>
<td>Monday</td>
<td>Frontal region</td>
<td>Lungs and hilum</td>
<td>Duodenum, pancreas</td>
<td>Ventral forearm supply structures</td>
<td>Anterior lower leg skin and subcutaneous layer</td>
</tr>
<tr>
<td></td>
<td>Tuesday</td>
<td>Temporal region</td>
<td>Lungs and hilum</td>
<td>Duodenum, pancreas</td>
<td>Palmar hand skin</td>
<td>Anterior lower leg deeper layer</td>
</tr>
<tr>
<td>6</td>
<td>Monday</td>
<td>Superficial facial region</td>
<td>Trachea</td>
<td>Aorta, vena cava, sympathetic trunk</td>
<td>Palmar hand subcutaneous layer</td>
<td>Anterior ankle skin and subcutaneous layer</td>
</tr>
<tr>
<td></td>
<td>Tuesday</td>
<td>Superficial facial region</td>
<td>Oesophagus</td>
<td>Kidney and retroperitoneum</td>
<td>Palmar hand deep layers</td>
<td>Anterior ankle tendons and supply</td>
</tr>
<tr>
<td>Day</td>
<td>Monday</td>
<td>Tuesday</td>
<td>Wednesday</td>
<td>Thursday</td>
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<tr>
<td>7</td>
<td>Deep facial region</td>
<td>Posterior mediastinum</td>
<td>Renal pelvis and ureter</td>
<td>Ventral upper arm skin</td>
<td>Dorsal foot skin and subcutaneous layer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Posterior mediastinum</td>
<td>Posterior abdominal wall</td>
<td>Posterior upper arm deep layer</td>
<td>Plantar foot skin and subcutaneous layer</td>
<td></td>
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<tr>
<td></td>
<td>Anterior orbital cavity</td>
<td>Sympathetic trunk</td>
<td>Pelvic blood supply</td>
<td>Ventral upper arm deep layer</td>
<td>Plantar foot deep layer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anterior orbital cavity</td>
<td>Internal intercostal space</td>
<td>Pelvic nerve supply</td>
<td>Ventral upper arm deep layer</td>
<td>Plantar foot deep layer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Holiday Break</td>
<td>Holiday Break</td>
<td>Holiday Break</td>
<td>Holiday Break</td>
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</tr>
<tr>
<td>8</td>
<td>Anterior orbital cavity</td>
<td>Sympathetic trunk</td>
<td>Pelvic blood supply</td>
<td>Ventral upper arm deep layer</td>
<td>Plantar foot skin and subcutaneous layer</td>
<td></td>
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<tr>
<td></td>
<td>Anterior orbital cavity</td>
<td>Internal intercostal space</td>
<td>Pelvic nerve supply</td>
<td>Ventral upper arm deep layer</td>
<td>Plantar foot deep layer</td>
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<td></td>
<td>Holiday Break</td>
<td>Holiday Break</td>
<td>Holiday Break</td>
<td>Holiday Break</td>
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<tr>
<td>9</td>
<td>Anterior orbital cavity</td>
<td>Anterior orbital cavity</td>
<td>Anterior orbital cavity</td>
<td>Anterior orbital cavity</td>
<td>Anterior orbital cavity</td>
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</tr>
<tr>
<td></td>
<td>Internal cranium and brain</td>
<td>Back skin</td>
<td>Gluteal region skin</td>
<td>Posterior upper arm skin and subcutaneous layer</td>
<td>Posterior thigh skin and subcutaneous layer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Internal cranium and brain</td>
<td>Back subcutaneous layer</td>
<td>Gluteal region superficial layer</td>
<td>Posterior upper arm deeper layer</td>
<td>Posterior thigh fascial and muscle layer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Internal cranium and brain</td>
<td>Back subcutaneous layer</td>
<td>Gluteal region superficial layer</td>
<td>Posterior upper arm deeper layer</td>
<td>Posterior thigh fascial and muscle layer</td>
<td></td>
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<tr>
<td></td>
<td>Orbital cavity, superior approach</td>
<td>Back lumbar and thorax muscles</td>
<td>Gluteal region intermediate layer</td>
<td>Posterior forearm deep layer</td>
<td>Popliteal skin and subcutaneous layer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Orbital cavity, superior approach</td>
<td>Back lumbar and thorax muscles</td>
<td>Gluteal region intermediate layer</td>
<td>Posterior hand skin and subcutaneous layer</td>
<td>Popliteal region deep layer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Orbital cavity, superior approach</td>
<td>Neck superficial layer</td>
<td>Gluteal region deep layer</td>
<td>Posterior hand deep layer</td>
<td>Posterior lower leg skin and subcutaneous layer</td>
<td></td>
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<tr>
<td></td>
<td>Orbital cavity, superior approach</td>
<td>Neck deep layer</td>
<td>Gluteal region deep layer</td>
<td>Fingers</td>
<td>Posterior lower leg deep layer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inner and middle ear</td>
<td>Neck deep layer</td>
<td>Perianal region</td>
<td>Fingers</td>
<td>Posterior ankle tendons, ligaments and joint</td>
<td></td>
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<tr>
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<td>Revision/Discussion</td>
<td>Revision/Discussion</td>
<td>Revision/Discussion</td>
<td>Revision/Discussion</td>
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<td>MCQ examination</td>
<td>MCQ examination</td>
<td>MCQ examination</td>
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</tr>
</tbody>
</table>
Supplementary Material 3. Topics of faculty anatomy lectures of the compulsory course IMED2202.

Muskuloskeletal tract

1. Introduction, limb plan and development.
2. Axillary region, brachial plexus.
3. Muscles and joints - general principles.
4. Bone development and growth.
5. Shoulder joint and girdle.
7. Clinical anatomy of the upper limb.
8. Lower limb: Overall plan.
10. Ankle and foot.
11. Dermatomes and myotomes of the limbs.
12. Regional anatomy of the vertebral column.
15. Functional anatomy: Walking – II.

Nervous system

1. Introduction to CNS.
2. Spinal cord.
3. Meninges, dural venous sinuses, CSF.
4. Development and histology of the nervous system.
5. Blood supply of CNS.
6. Anatomy of somatosensory system.
8. Thalamus and cerebral cortex.
10. Anatomy of motor pathways II.
12. Eye movements, Cranial nerves III, IV and VI, Cavernous sinus.
13. Temporal bone and the ear.
15. Auditory and vestibular pathways.
16. Cranial nerves V, VII.
17. Cranial nerves I, IX, X, XI and XII.
18. Autonomic nervous system - anatomy.
19. Postnatal plasticity.
20. Hypothalamus and limbic system.
21. Aging, trauma and repair in the nervous system.
Head and neck

1. Head and neck: General plan, muscles, fasciae.
2. Temporomandibular joint and mastication.
3. Clinical anatomy of the temporal bone and ear.
5. Head and neck: Lymphatic drainage, clinical importance.
**Supplementary material 4.**

Questionnaire for peer and teacher assessments of the group presentations. Two points were assigned to “Yes”, 1 point to “mostly”, 0.5 points to “seldom” and 0 points to “never”.

<table>
<thead>
<tr>
<th>Date:</th>
<th>Name Assessor:</th>
<th>Lecture topic:</th>
<th>Yes</th>
<th>Mostly</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Did the presenters use clear and concise language?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Was the pace of the lecture appropriate?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Did the lecture flow logically?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Were the PowerPoint slides clear and easy to read?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Was the lecture content understandable?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Was the lecture content clearly structured?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Were the examples/figures used clearly explained?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Was the lecture content interesting/engaging?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Did the presenters give references (indicate sources)?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. Was the content appropriately covered?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Supplementary material 5.

Selection from the voluntary anonymous online questionnaire returned by 21 students.

IMED2202: compulsory prosection-based course.
IMED2283: optional dissection-based course, 54 participants.

Note that students of the optional course also attended the compulsory course and had to pass continuous assessments and final examination IMED2232 (course number of the official final examination NS200, after the 2nd undergraduate year, integrating all topics from anatomy, histology, physiology and biochemistry), compare also Supplementary material 1.

1. How helpful was anatomical dissection for IMED2202 tests and exams?
   - extremely helpful: 15
   - somewhat helpful: 6

2. Have you given lecture-like presentations before you did IMED2283?
   - yes: 7
   - no: 14

3. Have you assessed your peers before you did it in IMED2283?
   - yes: 11
   - no: 10

4. Have you been assessed by peers before you were in IMED2283?
   - yes: 11
   - no: 10

5. How helpful was the choice of topics for the group presentations for the IMED2202 exams and tests?
   - extremely helpful: 7
   - very helpful: 13
   - not helpful: 1

6. How helpful was the choice of topics for the group presentations for the IMED2232/NS200 integrated exam?
   - extremely helpful: 6
   - very helpful: 13
   - not helpful: 2

7. How helpful were the group presentations themselves for the IMED2202 tests or exams?
   - extremely helpful: 6
   - very helpful: 13
   - not helpful: 2

8. How helpful were the group presentations for the IMED2232/NS200 integrated exam?
   - extremely helpful: 6
   - very helpful: 13
   - not helpful: 2

9. The guideline for the group presentation was
   - clear and easy to follow: 21
   - not very clear: 0
   - do not remember: 0

10. The guideline for assessing the group presentations was
    - very clear and easy to follow: 20
    - not very clear: 1
    - do not remember: 0

11. How much time did you use for preparing the group presentation?
    - less than 1 hour: 0
    - 1 to 3 hours: 1
    - 3 to 5 hours: 7
    - 5 to 10 hours: 11
    - more than 10 hours: 2

12. The workload for the IMED2283 Dissection unit was
    - too much: 1
    - just right: 20
    - low: 0
    - very low: 0

13. The workload for the group presentation was
    - too much: 1
    - just right: 19
    - low: 1
    - very low: 0

14. Support by the teacher for the preparation of the group presentation was
    - adequate: 21
    - not required: 0
    - not available: 0

15. Support by teacher during the presentation session (set up, technical problems, question time) was
    - very accommodate: 17
    - not adequate: 0
    - not given: 0
    - not required: 4

16. How was workload for preparation of group presentations divided between group members?
    - equally divided between group members: 18
    - work done by one member mainly: 1
    - work done by 2 members mainly: 2

17. Preparation for the group presentation was
    - very interesting and satisfactory: 19
    - necessary, but did not like it: 2
18. The setting (lecture theatre, being at the front, giving a Power point presentation) for the
group presentation was
  routine-like 7
  new to me, but easy to cope with 3
  somehow stressful beforehand, but easy once doing it 11
  very stressful before, during and afterwards 0
19. How often did you meet with your group members for preparation of the group presentation?
  we met as a group just for the presentation 0
  we met once before the presentation 3
  we met twice before the presentation 7
  we met 3 times before the presentation 6
  we met more than 3 times before the presentation 5
20. The team work for preparing the group presentation was
  routine-like team work 10
  satisfactory, because I got to know better other peers 6
  satisfactory, because it improved my team-working skills 4
  very difficult, because team members did not match well 1
  difficult, because I did not like the other members 0
21. What about conflicts in the team during the preparation for the group presentation?
  There were no problems or conflicts 13
  there were some problems/conflicts between team
  members, but they were easy to solve 7
  there were some problems/conflicts, but most were solved 0
  there were severe problems, difficult to solve 1
22. As an audience member, the group presentations were
  a unique learning experience 14
  better than lectures by teachers 4
  boring 0
  not as efficient as lectures by teachers 3
23. Satisfaction with own group presentation?
  I was very pleased with my presentation 12
  my presentation was routine-like 3
  I could have done better with my presentation 6
24. I would give my group presentation a grade (out of 100%)?
  more than 95% 0
  90-95% 2
  85-90% 3
  80-85% 13
  75-80% 2
  70-75% 1
  less than 70% 0
25. The criteria for peer-assessing the group presentations were
  adequate 13
  random or biased 0
  adequate, but weighting was questionable 8
26. Are or were you concerned that peer assessment would be different from teacher
  assessment?
  Not concerned 9
  concerned that teacher assessment would be harsher 8
  concerned that peer assessment would be harsher 4
27. Did peer assessment of group presentations improve your own presentation skills?
  Yes 17
  no 4
28. Assessing presentations by peers improved my own learning?
  Yes 17
  no 4