CURRICULUM



Master of Surgery (MS), Anatomy

Residency Programme

Faculty of Basic Science & Paraclinical Science

Bangladesh Medical University

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A: INTRODUCTION

A:1 Introductory Note

Bangladesh Medical University (BMU) is the only public medical university of Bangladesh. It was established in 1998 as an autonomous institution of national importance by an act of the Parliament that also defined its objectives and functions. The act granted the University the authority to confer post-graduate medical degrees and other academic distinctions. The University is located at Shahbagh at the centre of Dhaka, the capital of Bangladesh.

The academic activities of the Department of Anatomy are run under the Faculty of Basic Science and Paraclinical Science, one of the four faculties initially created in the University, and now renamed. The courses run by this Faculty are recognised medical qualifications in accordance with the Bangladesh Medical and Dental Council Act, and not withstanding anything contained in the Bangladesh Medical and Dental Council Act. The degree holders of this University are entitled to the same privileges as those awarded equivalent awards by any other recognised University of Bangladesh.

Anatomy is the oldest of the basic medical sciences. It is one of the very first disciplines that an undergraduate (and often, a postgraduate) medical student would encounter in the beginning of his/her student life. The learning of Anatomy establishes an understanding of the structural organisation of the human body upon which clinical understanding is developed. The Department of Anatomy is engaged in producing professionals who take up their career as teachers and researchers in the field of Anatomy.

Most of the postgraduate courses of different specialised institutes of the country have now been affiliated with BSMMU. Thus, the Department collaborates with other institutions of the country in dealing with their postgraduate Anatomy courses as well as the Anatomy portion of their postgraduate clinical courses, especially in terms of assessment. Foreign students from different countries have also been enrolled in different courses.

A:2 Historical Background

At its inception in 1966 as one of the departments of the Institute of Post Graduate Medicine the Department of Anatomy offered the degree of MSc (Master of Science) in Anatomy. The Institute was later renamed as Institute of Postgraduate Medicine and Research (IPGMR). After the liberation of Bangladesh, the course was converted into MPhil (Master of Philosophy) course. In 1980, additional BSc and MSc courses in Anatomy were introduced for non-medical students. These courses continued till 1983. Some of these students have done MPhil or PhD in Anatomy at home or abroad to pursue their career as anatomists. In July 2001, a three-year-long MS (Master of Surgery) Anatomy course was introduced replacing the two-year-long MPhil course. However, after producing four anatomists, the MS course was discontinued and the MPhil course was reintroduced. Anatomists who got their MSc, MPhil or MS degree from the Department are now serving as teachers in Anatomy at home or abroad.

In 2010, a 3-year-long MS residency course was started to replace the 2-year-long MPhil course. A three-year PhD course is also in the final process of organisation PhD will be open for career anatomists having an MS, MPhil or equivalent degrees in Anatomy recognized by BSMMU.

Apart from running courses aimed at producing or involving career anatomists, the Department had been involved in teaching the anatomical aspects relevant to different clinical disciplines for the students of the FCPS (Fellow of Bangladesh College of Physicians and Surgeons) courses in the past. Later on, when postgraduate courses like MD (Doctor of Medicine), MS (Master of Surgery) and MPhil were introduced in these disciplines at the University, the Department was given the task of teaching the anatomical aspects included in those courses. As continuing collaboration with the clinical disciplines, the Department is presently dealing with the teaching and assessment of anatomical knowledge and skills of the residents of the redesigned clinical MD and MS residency courses. DDS (Diploma in Dental Surgery) and D Card (Diploma in Cardiology) are two other courses served by the Department.

A:3 Departmental Location and Organisation of Space

The Department lies on the 6th floor of the Basic Sciences Building (Block-B) of BSMMU with extentions to other buildings of the University. It has got a Dissection Hall-cum-Museum, a Histology Class Room, a Histology Lab, a Developmental Anatomy Lab, a Genetics lab (being organized), a plastination lab (being organized), a mortuary, computer rooms and separate areas for students' self-learning activities.

A:4 Departmental Faculty and Staff

The present manpower structure of the Department is as follows:

Faculties:

a) Professor- 1
b) Professor of Genetics and Molecular Biology- 1
c) Curator (Associate Professor)- 1
d) Associate Professor- 1
e) Assistant Professor- 2

Others:

a) Research Assistant- 3
b) Section Officer- 1
c) Laboratory Technologist- 1
d) Artist-cum-Modeler- 1
e) Office Assistant-cum-Assistant Computer Operator- 1
f) Taxidermist- 1
g) MLSS- 2
h) Dome- 3
i) Cleaner- 1

The post of 'Chairman' is rotational at 3-year intervals.
The teaching faculties may have 'personal promotion' to be promoted to a higher post.
Additional Research Assistant/ Scientific Officers and other staff are often recruited in specific research projects.

A:5 Additional Courses Presently Run by the Department

At present, the Department is involved in four types of course:

a. A 2-year MPhil (Medical Science) Anatomy course- no new recruits are being taken
b. A 3-year PhD course in Anatomy (in the process of final organisation)
c. The Anatomy portion of the MD, MS, MPhil and Diploma courses of some clinical disciplines.
d. The Anatomy portion of the Undergraduate Nursing course

A:6 Vision Statement of the MS Anatomy Course

The MS Anatomy course aims at developing its residents as competent individuals who would contribute effectively to the learning of Anatomy directed towards its clinical use and development.

A:7 Competencies to be Achieved by the Residents

The Department expects that by completing the MS Anatomy course, the residents will achieve the competencies of the following:

1. Communicator and facilitator of learning in Anatomy
2. Scholar
3. Researcher
4. Professional
5. Collaborator & Manager
6. Developer of Anatomy

A:8 General Objectives of the MS Anatomy Course

The course aims at producing career anatomists who would possess appropriate cognitive, psychomotor and affective skills in different subdivisions of Anatomy and allied subjects, effectively correlated with their functional and clinical implications that would enable them to:

- Become self-directed, life-long deep learners in different subdivisions and aspects of Anatomy and be proactive in continuing professional development.
- Facilitate students' learning of Anatomy and allied subjects in the undergraduate and postgraduate courses following updated evidence-based understanding of the philosophies and techniques of medical education.
- Participate properly in the assessment of undergraduate and postgraduate students' cognitive, psychomotor and affective skills in Anatomy and allied subjects following updated evidence-based understanding of the philosophies and techniques of medical education.
- Approach to understand and make students understand Anatomy as a basic Science as well functional and clinical standpoints.
- Develop and nurture a scientific, inquisitive and analytical mind and skills adequate for designing, performing, interpreting and presenting scientific research, for disseminating the results as well as for supervising research in the field of Anatomy and allied subjects.

- Contribute effectively to the planning, implementation and evaluation of various undergraduate and postgraduate course curricula in Anatomy and allied subjects and thereby to the advancement of these subjects.
- Work effectively in teams as teachers, researchers, assessors, educational managers and educational planners with fellow anatomists and others.
- Contribute effectively, as members of teams of specialists, to medico-legal activities in terms of identification of body parts, age determination, DNA analysis etc.
- Prepare themselves as eager and able anatomists to contribute to the continuing development of Anatomy as a discipline and thereby aid the development of medical science at the national and international levels.

A:9 Some Essential Information Regarding the Course

Course organisation

The duration of the MS Anatomy course 3 (three) years:

Phase- A: two-year taught course, each 'Year' being divided into 3 'Blocks'
Phase- B: one-year thesis research

Medium of instruction

The medium of instruction is English.

Entry qualifications

A. An applicant must have the following criteria:
   - MBBS or equivalent degree recognised by BMDC.
     (An MSc in Anatomy from the Institute of Postgraduate Medicine and Research (IPGMR) is also allowed to apply).
   - Completion of one year after internship or in-service training.
   - BMDC registration.

B. An applicant who has already been enrolled or selected in any other course in any University / Institute including BSMMU, is considered for admission if he / she provides satisfactory documents regarding cancellation of his / her existing course. If any resident is found to have concealed any information regarding this, the authority shall have the right to cancel his / her admission.

C. If the applicant is in government service, his / her age should not exceed 45 years at the time of application.

D. An online version of the application form is available in the BSMMU website.

Method of selection

A. After being identified through official scrutiny as eligible for the course each applicant is called for a common written objective-type entrance test. On the undergraduate knowledge of Basic Medical Sciences subjects- Anatomy, Biochemistry, Microbiology, Pathology, Pharmacology, and Physiology (60%) and clinical subjects (40%) . The questions are selected from the subjects taught in the

undergraduate medical course. Exam time: 180 minutes, Total marks: 200. However, a minimum marks as determined by the Examination committee before examination must be obtained to get admitted into the course. As determined by the university authorities, the selected applicants may have to face a medical fitness examination before admission.

B. For applicants in government service:

They are required to secure deputation or leave from the relevant government authorities before admission.

C. For foreign applicants-

- The application is scrutinised by a selection committee formed by the Faculty. The eligible applicant is required to appear before an Interview Board for the final selection.
- The applicant to collect an NOC (No objection certificate) from their respective missions / embassies in Bangladesh and other relevant organisations and from WHO.
- The MBBS equivalent degree requires recognition of equivalence from Bangladesh Medical and Dental Council (BMDC).
- The applicant should must have an IELTS score of a minimum of 6.5 (relaxable).
- The applicant must submit their one-year internship certificate.
- One year has to be passed after their internship.
- Their training certificates (if any) obtained from foreign institutions shall have to be acceptable to the university.
- The candidate's age should not be over 45 years at the time of enrolment.

Date of joining

Selected candidates must join the course within the date mentioned in the letter of selection; otherwise, the candidate's admission shall be cancelled automatically.

Number of seats

It is determined by the faculty of Basic Medical Sciences. According to needs it is usually ten per year.

Time of commencement of the course

First March of every calendar year.

Stipend for the non-government residents

Each non-government resident gets a monthly stipend for 36 months.

Fees & Leave of Absence

Regarding the fees and leave of absence the rules and regulations of the Faculty of Basic Medical Sciences, as endorsed by the University authorities are followed.

Residency Agreement

The residents must abide by legislations governing the residency program of the University. Every resident must sign a 'Residency Agreement' accepting the legislations of the program at the time of enrolment.

A:10 Educational Strategy and Learning Methods

- The MS Anatomy course is a competency-based course- putting adequate emphasis on attaining adequate specialised knowledge and specific skills and developing attitudes as relevant to a career anatomist with specified roles, like those of a facilitator of learning (teacher), researcher as well as an educational planner and manager.
- Detailed course objectives guide the residents as well as departmental faculties in the learning activities on every topic.
- Formal learning sessions include interactive lectures, tutorials, demonstrations and practical classes, learning sessions from guest teachers, seminars and journal clubs. Informal discussions in the department and other forms of informal learning experiences from extra-departmental sources are also encouraged.
- Small-group sessions are given preference over large-group sessions as far as feasible. Hands-on experiences are preferred to theoretical activities wherever applicable.
- Learning materials like books, illustrations collected from books, online sources and other sources, cadavers, skeletons, individual bones, viscera, models, specially prepared museum specimens, diagnostic images, histology slides, embryology slides, handouts, multimedia presentations etc. are available to enhance learning.
- Self-learning materials (textual materials and illustrations) in addition to the above materials are provided from different printed and online sources.
- Self-learning facilities are also available in the Department in the form of interactive software in CDs and DVDs as well as virtual facilities available online.
- Special placements in different facilities in the Department or outside are made to ensure specialised exposure to different equipments, practical procedures and other relevant activities.
- Specific assignments (written, oral and practical) are assigned to the residents for exercising specific aspects of knowledge, skills and attitude.
- Detailed lists of skills to be attained in different aspects of Anatomy are available along with checklists.
- A log book (mandatory) and a portfolio (optional) are maintained customising them to the specific needs of the course.
- The higher levels of knowledge, skills and attitude, rather than rote memorisation, are addressed in teaching so that the residents develop proper understanding of anatomical concepts, principles and phenomena and relate anatomical information to principles. Thus, looking for answers to the 'why' and 'how' aspects of anatomy, rather than the 'which', 'when' and 'where' aspects are emphasized.
- A holistic and 3-dimensional approach is taken in understanding the structures in the human body integrating the regional and systemic approaches to Anatomy whenever and wherever necessary.
- Attentions of residents are drawn to the relationships of gross anatomical features in 3-dimensional and sectional forms with features in surface projections, diagnostic images, microscopic features, developmental processes and as well as with the basic homologies and analogies in comparative anatomy so that one can be explained by the other.
- The learning of Anatomy is correlated with everyday activities giving special emphasis on structure-function relationship and dysfunctional outcomes. Thus, problem-oriented and problem-based approaches are incorporated in teaching-learning as far as feasible.
- Keeping in mind that after completing the course the residents will be serving principally as undergraduate and postgraduate medical teachers, special emphasis is put on attaining appropriate

skills and developing proper attitude related to teaching and assessment in Anatomy rather than on the mere attainment of anatomical knowledge and skill.

- Extra-curricular experiences are fostered so that the residents develop into complete human beings with interests in different aspects of human life and civilization and ability to incorporate them into their professional life.
- A friendly educational environment is fostered so that the residents take learning as fun and not as burdens.

A:11 Resident's Responsibilities (in the context of academic misconduct)*

'Academic misconduct' is defined as any activity that tends to undermine the academic integrity of the institution. The university may discipline a resident for academic misconduct. Academic misconduct may involve human, hard-copy, or electronic resources.

Policies of academic misconduct apply to all course-, department- and university-related activities, including field trips, conferences, performances and exams outside of a specific course structure (such as take-home exams, entrance exams, theses exams) and research work outside of a specific course structure (such as lab experiments, data collection, service learning, and collaborative research projects). The faculty member may take into account the seriousness of the violation in assessing a penalty for acts of academic misconduct. The faculty member must report all cases of academic misconduct to the appropriate official. Academic misconduct includes, but is not limited to, the following:

1. Cheating

Cheating is considered to be an attempt to use or provide unauthorised assistance, materials, information, or study aids in any form and in any academic exercise or environment.

A resident must not:

a. Use external assistance on any "in-class", "take-home" or "in- hall" examination, unless the involved faculty member specifically has authorised external assistance. This prohibition includes, but is not limited to, the use of tutors, books, notes, calculators, computers, and wireless communication devices.

b. Use another person as a substitute in the taking of an examination or quiz, nor allow other persons to conduct research or to prepare work, without advanced authorisation from the involved faculty member to whom the work is being submitted.

c. Use materials from a commercial term paper company, files of papers prepared by other persons, or submit documents found on the Internet.

d. Collaborate with other persons on a particular project and submit a copy of a written report that is represented explicitly or implicitly as the student's individual work.

e. Use any unauthorised assistance in a laboratory, at a computer terminal, or on fieldwork.

f. Steal examinations or other course materials, including but not limited to, physical copies and photographic or electronic images.

g. Submit substantial portions of the same academic work for credit or honours more than once without permission of the instructor or program to whom the work is being submitted.

h. Without authorisation, alter a grade or score in any way, nor alter answers on a returned exam or assignment for credit.

2. Fabrication

A resident must not falsify or invent any information or data in an academic exercise including, but not limited to, records or reports, laboratory results, and citation to the sources of information.

3. Plagiarism

Plagiarism is defined as presenting someone else's work, including the work of other students, as one's own. Any ideas or materials taken from another source for either written or oral use must be fully acknowledged, unless the information is common knowledge. What is considered "common knowledge" may differ from course to course.

a. A resident must not adopt or reproduce ideas, opinions, theories, formulas, graphics, or pictures of another person without acknowledgment.

b. A resident must give credit to the originality of others and acknowledge indebtedness whenever:

1. directly quoting another person's actual words, whether oral or written;
2. using another person's ideas, opinions, or theories;
3. paraphrasing the words, ideas, opinions, or theories of others, whether oral or written;
4. borrowing facts, statistics, or illustrative material; or
5. offering materials assembled or collected by others in the form of projects or collections without acknowledgment

4. Interference

A resident must not steal, change, destroy, or impede another student's work, nor should the student unjustly attempt, through a bribe, a promise of favors or threats, to affect any resident grade or the evaluation of academic performance. Impeding another resident work includes, but is not limited to, the theft, defacement, or mutilation of resources so as to deprive others of the information they contain.

5. Violation of Course Rules

A resident must not violate course rules established by a department, the course syllabus, verbal or written instructions, or the course materials that are rationally related to the content of the course or to the enhancement of the learning process in the course.

6. Facilitating Academic Dishonesty

A resident must not intentionally or knowingly help or attempt to help another student to commit an act of academic misconduct, nor allow another student to use his or her work or resources to commit an act of misconduct.

* Adopted from the documents of Indiana University, USA

A:12 Administrative Structure of the Course

(Charter of Responsibilities of a senior Resident Supervisor, the Course Co-ordinator and the Course Director)

A. Senior Resident:

Eligibility:

- Residents of Year -2 (of Phase-A) and Phase- B .

Responsibilities:

- They are responsible for guiding & facilitating the learning by their juniors, as instructed by the department.

B. Supervisor:

Eligibility:

- Assistant Professor and above.

Responsibilities:

- To maintain attendance and discipline of the Residents.
- To provide orientation, guidance and feedback to resident's learning.
- To sign day-to-day performance record (log book).
- To sign casual leave of the resident and forward it to the Chairman.
- To be responsible for completing the following Block programmes-
  - a) Academic performance
  - b) Clinical performance (if applicable)
  - c) Global competence
  - d) Organisation of End-of-Block assessment
  - e) Leave report
- To assess residents competence outcomes.
- To send End-of-Block Report to the Course Coordinator

Each supervisor is responsible for one year of one Batch of residents at a time.

- This duty is rotational to expose every batch to more than one supervisor.

C. Course Coordinator:

Eligibility:

- Associate Professor and above.

Responsibilities:

- To be responsible for planning, organising and providing management support to training and academic activities of the residents in the Department.
- To supervise, guide and lead the team of Supervisors.
- To circulate the Training Rotation Schedule to the Supervisors for implementation.
- To assist the Course Director in planning, oranizing and managing the entire course
- To maintain inter-departmental communications regarding training, end of block report and circulation of the reports.
- To compile End-of-Block report (EOBR) and prepare the Phase Completion Report (PCR).
- To compile & maintain leave records and take necessary actions as per university rules in consultation with the chairman.
- To report to the Course Director.

D. Course Director:

Eligibility:

- Any Professor of the respective faculty.

Responsibilities:

- To supervise, guide and lead team of Course Coordinators.
- To appoint Course Coordinators as per recommendations of the Chairman.
- To prepare the Training Rotation Schedule (rota) and circulate it to the Course Coordinators/ Chairman.
- To collect and endorse Phase Completion Report.
- To certify qualifications eligibility for appearing in the phase final examinations.
- To prepare training rotation schedule for Residents with incomplete or defolters, in consultation with respective Chairman.
- To manage disputes and conflicts in consultation with the Dean and refer appropriate cases to the appropriate authority through the Dean.
- To submit Phase Completion Report to the Dean for onward presentation in the Academic Council.
- To report to the Dean.

A:13 Course Framework

A:13.1 Phase- A (PA)- 2 years

Year- 1 (PAY1)- 1 year

Block- 1 (PAY1B1)

A.

a. Introduction to Anatomy as a science (including historical perspectives, anatomical nomenclature and spelling, English in Anatomy and general principles of Anatomy).
b. Principles of comparative Anatomy; human being's place in the taxonomy of the animal kingdom; the idea of evolution of man & relevant challenges to the idea.
c. Basic spatial and structural organisation of the human body & Human Systemic Anatomy (General Anatomy)
d. Cell Biology & Basics of Molecular Biology
e. Postmortem changes in the human body, cadaver preservation techniques & museum techniques
f. Visual exposure to the above topics
g. Practical & clinical exposure to the above topics (as applicable)
h. Preparation of embryological slides (whole mount)

B.

End-of-Block formative assessment & publishing of results

Block- 2 (PAY1B2)

A.

a. Basic Genetics
b. Medical Genetics
c. General Developmental Anatomy (including prenatal and postnatal growth & development, Neonatal Anatomy & Teratology
d. Anatomy of reproduction (including fertility & Assisted Reproduction)
e. Basics of Physical Anthropology
f. Basics of Forensic Anatomy (age, sex and race determination)
g. General aspects of Medical Education
h. Preparation of embryological slides (continued from the previous block - section)

i. Science & art of teaching and assessment regarding topics "c" and "d" of Block-1 and topics "a", "b" "c" and "d" from this Block.

B.

End-of-Block formative assessment & publishing of results

Block- 3 (PAY1B3)

A.

a. General Histology
b. Human Abdomen, Pelvis & Perineum
    i. Topographic Anatomy (including surface anatomy)
    ii. Sectional Anatomy & diagnostic images
    iii. Functional & Clinical Anatomy
    iv. Development & related anomalies
    v. Histology
c. Visual exposure to the above topics
d. Practical & clinical exposure to the above topics (as applicable)
e. Science & art of teaching & assessment regarding the above topics

B.

End-of-Block formative assessment & publishing of results

End-of-Part summative assessment (covering all 3 Blocks of Year-1) & publishing of results

Year-2 (PAY2)- 1 year

Block- 4 (PAY2B4)

A.

a. Human Head and Neck
    i. Topographic Anatomy (including Surface Anatomy)
    ii. Sectional Anatomy & diagnostic images
    iii. Functional & Clinical anatomy
    iv. Development & related anomalies
    v. Histology
b. Human Neuroanatomy
    i. General Neuroanatomy

(including development & related anomalies)

ii. Systemic Neuroanatomy
iii. Functional & Clinical Neuroanatomy
iv. Sectional Neuroanatomy and diagnostic images
v. Neurohistology

c. Visual exposure to the above topics
d. Practical & clinical exposure to the above topics (including dissection and preparation of histology slides of the above-mentioned body parts).
e. Science & art of teaching & assessment regarding the above topics

B.

End-of-Block formative assessment & publishing of results

Block- 5 (PAY2B5)

A.

a. Human Thorax (including brest), back and vertebral column
b. Human Superior Extremity
c. Human Inferior Extremity

i. Topographic anatomy (including surface anatomy)
ii. Sectional anatomy & diagnostic images
iii. Functional & clinical anatomy
iv. Development & related anomalies
v. Histology

d. Visual exposure to the above topics
e. Practical & clinical exposure to the above topics (including dissection and preparation of histology slides of the above-mentioned body parts).
f. Science & art of teaching & assessment regarding the above topics
g. Research Methodology & Medical Statistics
h. Elective subject (continued into the next block)

B.

End-of-Block formative assessment & publishing of results

Block- 6 (PAY2B6)

A.

a. Advanced educational science related Anatomy
   i. How to design a proper curriculum in Anatomy
   ii. How to plan & execute facilitation of learning (i.e. teaching) in Anatomy
   iii. How to design & use instructional materials in Anatomy
   iv. How to plan & implement proper assessment of students in Anatomy
b. Elective subject (continued from the previous block)

B.

End-of-Block formative assessment & publishing of results

A:13.2 Phase- B (PB)- 1 Year

Block- 7 (PBB7)- 4 months

Week 1 – Week 15

a. Assignments related to thesis research & pilot study (if applicable)
b. Thesis research

Block- 8 (PBB8)- 4 months

Week 16 – Week 31

Thesis research (contd.) and reporting.

Block- 9 (PBB9)- 4 months

Week 32 – Week 47

Thesis research (contd.) and reporting.

Week 48 – Week 52

a. Thesis presentation (before an audience comprising teachers & residents of the Faculty And, if applicable, from outside)
b. Submission of the thesis
c. Assessment of the thesis and thesis defense exams & comprehensive oral

A:14 Assessment Formats

Assessment in the MS Anatomy course is the process of forming a judgment about the quality and extent of residents' achievement or performance. Therefore, by inference, it is a judgment about their competencies. Assessment inevitably shapes the learning that occurs; that is, what residents learn and how they learn should reflect closely the purposes and aims of the course.

Assessment is combined with feedback with a view to improving residents' competencies. The MS Anatomy assessments are of two types: 'Formative' and 'Summative'.

A:14.1 Formative assessment

The formative assessments include:

- Assessment at within-Block working situations: at laboratories, dissection halls and classes at seminars, journal club presentations as presenters and audienceas facilitators of others' learningas one of groups
- Assessment at special placements,
- Assessments through home assignments
- End-of-Block Examinations

Each resident has to maintain **Resident Log book** throughout the course, where resident activities and assessment results are recorded. Maintenance of an own **Resident Portfolio** is optional.

a. Eligibility as a candidate for End-of-Block Examinations

An End- of- Block of Examinations are open to any candidate who has undertaken the course of study prescribed for that Block.

b. Moderators & Examiners for End-of-Block Examinations

There are two Examiners (preferably one external) for the Oral and Practical exams.

Each examiner also examines the written answer scripts for one group of questions.

The Departmental Examination Committee selects the Question-setters, one Moderator (of questions) and two Examiners, and informs the Course Director as well as the Dean of the Faculty of Basic Science and Paraclinical Science. Each Examiner should be of the rank of Professor or Associate Professor. Only in absence of an eligible Moderator/Examiner an Assistant Professor of the Department may be appointed, provided s(he) has worked as a regular Assistant Professor for at least three years. However, the Question-setters may be of the rank of Assistant Professor

c. Marks distribution for End-of-Block Examinations (1 Paper for each Block)

Part of examination	Allotted marks	Time	Pass marks	Marks obtained	
				100%	30%
Written Exams Objective questions (SAQ) short answer questions	100 30 70	3 hours	60		
Oral Exams	100		60		
Practical Exams	100		60		
Total	300				

30% of the marks obtained in the End-of-Block, written, oral and practical exams are added to 70% of the marks obtained in the written, oral and practical exams of the End-of-Year examinations.

d. In case of failure in an End-of-Block Examination

if one fails in the end-of-block of exams, (s)he has to repeat the exam

A:14.2 Summative assessment

The summative assessment exams include:

- End-of-Year Exams for Year- 1 and Year- 2 of Phase- A
- Phase- B Exams.

Phase-A Exams

a. Eligibility as a candidate for End-of-Year Examinations

i) Phase- A, Year- 1 Examinations are open to any candidate who:

- has undertaken the course of study prescribed for Year- 1, and has attended at least 75% of the classes.
- has completed all the assignments prescribed in the curriculum for Year- 1.
- has passed all the End-of-Block Exams of year 1.
- has earned a SATISFACTORY grade in the course on Medical Education offered by the University.

ii) Phase- A, Year- 2 Examinations are open to any candidate who:

- has previously passed the End-of-Year- I Examinations in at least two of the three Papers.
- has undertaken the course of study prescribed for Year- 2, and has attended at least 75% of the classes.
- has completed all the assignments prescribed in the curriculum for Year- 2 .
- has passed all the end-of-block Exams of year 2.
- has earned a SATISFACTORY grade in the course Research Methodology and Medical Statistics offered by the University.

a. Moderators and Examiners for End-of-Year Examinations

There are four Question-setters (External and Internal) of the rank of Professor, Associate Professor or regular Assistant Professor for each of the three Papers.

There are two Moderators of questions (one External and one Internal for each of the three Papers), each of the rank of Professor or regular Associate Professor. The Moderators are different from the Question-setters.

There are two Examiners (one External and one Internal for each Paper), each of the rank of Professor or regular Associate Professor. Each examines one Group of questions of the answer scripts. The two Examiners together hold the Oral and Practical examinations.

The Departmental Examination Committee proposes the names of the Question-setters, Moderators and Examiners to the Dean of the Faculty of Basic Science and Paraclinical Science, and informs the Course Director. The Academic Council of BSMMU formalises the appointments on the basis of the recommendations from the Dean.

b. Marks distribution for End-of-Year Examinations (For each of the 3 Papers*)

Part of examination	Allotted marks	Time	Pass marks	Marks obtained		
				30% marks of End-of Block Exams	70% marks of End-of-Year Exams	Total marks
Written Exams	100	3 hours	60			
Oral Exams	100		60			
Practical Exams	100		60			
Total	300					

* Papers- I, II, & III for Year- 1, and Papers- IV, V & VI for Year- 2.
Each Paper of the Phase-A Summative Exams corresponds to the corresponding Block (Paper-I for Block-1, Paper-II for Block-2 etc.).

c. In case of failure in an End-of-Year Examination

A resident who fails an End-of-Year Examination may appear in a subsequent examination (which is held at 6-month intervals) without further pursuing a course of the same studies up to a time-limit fixed by the Academic Council of BSMMU. A resident who has passed in any Paper (in all its the components- Written, Oral & Practical) in any End-of-Year examination is not required to appear in the examinations of the same Paper in any subsequent examination

Phase- B Exams

a. Eligibility as a candidate for Phase- B (Thesis) Examinations

An one-year thesis research is mandatory for the course. The research work can be carried out in BSMMU or in any reputed institution of the country or abroad that is recognised by BSMMU.

Phase- B examinations are open to any candidate who:

- has previously passed the End-of-Year- 2 examinations.
- has conducted an approved research work for at least one year at BSMMU, Dhaka, or any other institution approved by BSMMU, and has submitted a thesis embodying the results of that research.
- has completed all the assignments prescribed in the curriculum for Phase- B.
- has submitted five unbound copies of the thesis to BSMMU within the stipulated time.
- has produced a certificate of completion of his/her work from the Guide of the thesis countersigned by the Chairman of the Department.

b. Guide of the thesis

The Guide of the thesis should be of the rank of Professor or regular Associate Professor at BSMMU. There may be a Co-guide of an equivalent rank from any reputed institution recognised by BSMMU

c. Examiners for Phase- B Examinations

There is a Board of Examiners consisting of four Examiners in the area of speciality related to the thesis research, each of the rank of Professor or regular Associate Professor, one being the Chairmen and the others being the Members of the Board. At least two of the Members are Externals. The Supervisor of the research work may be a member of the board, and the Internal Member of the Board other than Supervisor functions as the Chairman.

The Departmental Examination Committee proposes the Board Examiners to the Dean of the Faculty of Basic Science and Paraclinical Science, and informs the Course Director. The Academic Council of BSMMU formalises its appointment on the basis of the recommendations from the Dean.

d. Marks distribution for Phase- B Examinations

Part of examination	Total marks	Pass marks	Marks obtained
Thesis	200	120	
Thesis defense & Comprehensive viva	100	60	

An MS Anatomy thesis is judged **unacceptable** if it requires major revisions before it can meet requisite standards.

A thesis that requires no revisions or only minor revisions is judged **acceptable**.
Such a thesis is graded as any of the following:

- SUFFICIENT…… (60% - 69% marks)
- GOOD…… (70% - 79% marks)
- EXCELLENT…… (80% - 89% marks)
- OUTSTANDING…… (90% or more marks)

e. In case of failure in the Phase- B Examinations

- A resident who has failed the Phase- B Examinations because her/his thesis has been labelled as UNACCEPTABE may reappear in a subsequent examination after necessary 'major revisions' as suggested by the Board of Examiners in the previous examination.
- In case a resident is unable to satisfy the Board of Examiners in the 'Thesis defence and Comprehensive viva' part even though the thesis is adjudged acceptable, the Board may recommend to the Academic Council that the resident may be permitted to appear in another examination on the same part after a lapse of 6 months from the first examination. No resident is allowed to appear in such an examination on the same thesis for more than two times.
- If a thesis is judged inadequate for the award of the MS degree, the examiners may permit the candidate to do more research work in order to improve the standard of the thesis, and may recommend the Academic council that the candidate may be allowed to appear at a new examination after necessary improvement of his/her thesis.

A:15 Departmental Examinations Committee

Structure

It consists of three senior most faculties of the Department.

Responsibilities

- Assuring the quality of the assessment methods by:

- Reviewing all examinations
- Ensuring content validity of exams by blueprinting
- Designing and selecting the assessment methods that will reflect the objectives of the course/module
- Setting standards of expected performance
- Informing students of assessment requirements at the beginning of the block/module/rotation

Ways of working

- Scrutinizing and monitoring of assessment quality by: Ensuring University
- Reviewing reports from Block and Module
- Periodically reviewing item performance
- Periodically reviewing the distribution of grades
- Recommending improvements and change
- Ratification of changes in the assessment process
- Approval of timetables and invigilation guidelines of final examinations
- Notification of appropriate bodies through the Chairman of the department to recommend remedial action regarding problem and failed students whose academic progress is at risk
- Preparation of all examination time tables in liaison with Course Coordinators and Course manager, Course supervisor and student representatives.
- Copying, storage, and ensuring security of all examination question papers Coordination of invigilation and assign
- Registration for preparation of the MS tanscript
- Custody of student log books of results
- Methods of Assessments should be both formative and summative.
- Continuous evaluation of the assessment process
- Conducting research in the area of assessments
- Conducting regular faculty development

A:16 Written Exams Guidelines

A:16.1 Summative Paper-wise Distribution of Topics

(Applicable for the Summative Written, Oral and Practical Exams

The marks shown on the right are applicable for the written exams only).

Phase- A: Year-1

Paper- I

Group- A

a. Introduction to Anatomy as a science 10
- **i.** Historical perspectives
- **Ii.** Anatomical nomenclature and spelling
- **iii.** English in Anatomy
- **iv.** General principles of Anatomy

b. Basic spatial and structural organisation of the human body and human systemic anatomy (general anatomy) ….....30

c. Comparative anatomy and evolution of human being: 10
- **i.** Principles of comparative anatomy
- **Ii.** Human being's place in the taxonomy of the animal kingdom
- **iii.** Idea of evolution of human being and relevant challenges to the idea

Group- B

a. Cell biology and basics of molecular biology ….....30

b. Postmortem changes and preservation ….....10
- **i.** Basics of postmortem changes in the human body
- **Ii.** Cadaver preservation principles and cadaver embalming techniques

c. Developmental anatomy of the chick (for practical exams only)

d. Science and art of teaching and assessment in human systemic anatomy(ie. general anatomy), cell biology and basics of molecular biology ….....10

Phase- A: Year-1

Paper- II

Group- A

a. General developmental anatomy 35
b. Basics of forensic anatomy and physical anthropology 10
c. The science and art of teaching and assessment in general developmental anatomy 5

Group-B

a. Anatomy of reproduction (including fertility & assisted reproduction) 15
b. Basic and medical genetics 30
c. The science and art of teaching and assessment in genetics 5

Phase- A: Year-1

Paper- III

Group- A

a. General histology 35
- **i.** Histologic techniques
- **Ii.** Microscopy
- **iii.** Histology of the basic tissues

b. Histology of the structures of the human abdomen, pelvis, and perineum ….....10

c. The science and art of teaching and assessment in histology of the basic tissues 5

Group- B

a. Human abdomen, pelvis and perineum ….....45
- **i.** Topographic anatomy (including surface anatomy in practical exams only)
- **ii.** Sectional anatomy and diagnostic images
- **iii.** Functional and clinical anatomy
- **iv.** Development and related anomalies

b. The science and art of teaching and assessment in anatomy of human abdomen, pelvis, perineum ….....5

Phase- A: Year-2

Paper- IV

Group- A

a. Human head and neck 30
- **i.** Topographic anatomy (including surface anatomy)
- **Ii.** Sectional anatomy and anatomy related to diagnostic images
- **iii.** Functional and clinical anatomy
- **iv.** Development and related anomalies
- **v.** Histology

b. Neuroanatomy (Portion- I) ….....15

c. The science and art of teaching and assessment in: Human head & neck 5

Group- B

a. Neuroanatomy (Portion- II) ….....45
b. The science and art of teaching and assessment in neuroanatomy 5

Phase- A: Year-2

Paper- V

Group- A

a. Human thorax (including the Breast), Back & Vertebral column 40
- **i.** Topographic anatomy (including surface anatomy)
- **Ii.** Sectional anatomy and anatomy related to diagnostic images
- **iii.** Functional and clinical anatomy
- **iv.** Development and related anomalies
- **v.** Histology

b. The science and art of teaching and assessment in Human thorax (including the Breast), Back & Vertebral column, superior extremity and inferior extremity. ….....10

Group- B

a. Human superior extremity. ….....25
- **i.** Topographic anatomy (including surface anatomy)
- **Ii.** Sectional anatomy and anatomy related to diagnostic images
- **iii.** Functional and clinical anatomy
- **iv.** Development and related anomalies

b. Human inferior extremity 25

Same as for 'a'

Phase- A: Year-2

Paper- VI

Group- A

a. Advanced educational science related to Anatomy 50
- **i.** How to design a proper curriculum in Anatomy ….....5
- **Ii.** How to plan & execute facilitation of learning (ie., teaching in Anatomy) ….....5
- **iii.** How to design & use instructional material in Anatomy 20
- **iv.** How to plan & implement proper assessment of students in Anatomy 20

Group- B

a. Elective subject – any one of the following ….....50
- **i.** Customised Physiology
- **Ii.** Histopathology
- **iii.** Advanced Genetics
- **iv.** Advanced Developmental Anatomy
- **v.** Assisted Reproduction
- **vi.** Advanced Neurohistology

- **NB**. The subjects of Medical Education, Biostatistics and Research Methodology will only have formative assessment in the relevant Blocks. No summative assessments apply to them.

A:16.2 Special Considerations Regarding Written Questions

Please note that:

a) In each question paper(excepting Paper–vi)of the Summative Exams there should be:

- One Essay Question carrying 10-marks without marks breakdown (with one option)*.
- 11 SAQs (or cluster SAQs), each carrying 6 to 9 marks with marks break-down for the cluster (eg.,2+3+2).
- One question asking for drawing and labeling carrying at least 4 marks.
- At least one problem-based question.
- At least one set of questions carrying each of the following Bold-faced instructions:
    - **"Explain using your understanding of anatomy (Any three)"** (Out of 4, each carrying at least 3 marks).
    - **"Write briefly on (Any three)"** (Out of 4, or any 2 out of 3, each carrying at least 3 marks).
      (But the topic should be very specific, not very broad, as usually asked for in "short notes")
    - **"Differentiate between the following (Any three**)" (Out of 4, each carrying at least 4 marks).

b) A question (or a portion of a question) for which a diagram is mandatory, should carry the instruction "(*use diagram*)" in Italics at its end.

c) There should be options carrying about 25 marks in total (including the 10-marks option).

d) In each question paper of the Formative Exams:

Out of a total of 50 marks, 15 marks are allotted for objective questions (eg. Fill-in-the-gaps,single-sentence True /False questions,MCQ) .The remainder (35 marks) is allotted to SAQ.

e) Functionally-oriented and clinically-oriented questions addressing the higher levels of cognitive domain should be preferred.

* These question should ask for broad descriptive or analytical answers that would how the ability of critical thinking, deeper understanding and writing. But the topic should be represent specific aspect of anatomy of a particular organ/structure/part/phenomenon, rather than the whole of it.

A:17 Card for oral and Practical Exams and OSPE Station Format

A:17.1 Instruction for using the card

What the card means

The 'card' for each Block or Paper is a **semi-structured format** for an Oral-Practical Exam. It has an 'Oral part' and a 'Practical part'. In it, the course content for the Block or Paper has been divided into 'Groups' and 'Compartments'.

The Examiners shall use it as a guide for conducting the exam.

What the examiners should do before the exam

For the 'Oral' part:

- The Examiners shall fill out up to three columns of the card: 'Part or system of body', 'Tool' and 'Topic' (as applicable) on the basis of the Specific Objectives and Course Content of the particular Block or Paper. One or more 'Compartments' have to be selected from every 'Group' according to the instruction for the group. Then, for every selected compartment, one topic has to be chosen.
- The column 'Part or system of body' should be filled out using the keys provided. The selection should be such that a rational distribution of part/system is ensured according to their respective weights. In the 'Tool' column, at least one of each type of instruction tool (living body, cadaver, viscus, skeletal component, figure or model etc. as applicable) needs to be chosen.

For the 'Practical' part:

- (The OSPE stations have to be arranged as per the supplied OSPE format).
- For the 'Other practical performances', the column 'Topic or code no. for selected problem' should be filled out with appropriate selections (following the supplied lists, where instructed).

Combined, the 'Oral part' and the 'Practical part' should cover the whole course content in a rational manner-avoiding repetitions. The two parts have to be stapled together. A photocopy of this combined filled-out card has to be produced for the 2nd Examiner.

A number of such filled-out cards (at least one and a half times the number of examinees) with different combinations should be prepared.

What the examiners should do during the exam (in sequence):

- Ask each examinee to pick up a filled-out card through a lottery, which will be used to assess that particular examinee in both 'Oral' and 'Practical' exams (this does not apply to the OSPE, which is the same for all examinees). Relevant materials like the 'Tools', 'Problem', 'Microscope slide' mentioned in the picked cards are made available with the help of the departmental organisers.
- Arrange and conduct the OSPE (for all the examinees simultaneously).
- Ask the examinees to sit on allocated seats, and be ready for the rest of the examinations.
- Provide a copy of the part of the filled-out card called 'Other practical performances', containing relevant instructions (as shown), as picked up through the lottery, along with a 'Problem' and a 'microscope slide' (as indicated in it), to each examinee.
- Ask the examinees to perform the tasks as the above copy instructs.
- Examine the OSPE answer scripts (each Examiner examining for half of the questions) and put marks in the allocated cell of the respective cards.
- Call the examinees one by one (according to their roll numbers) to the Oral exam table and continue through the practical exam
  (the first examinee may be called before she/he has completed the given tasks- he/she is allowed to do so after his/her Orals).
- Ask questions according to the 'Topics' and using the 'Tools' as indicated in the card picked up by the examinee through lottery.

- Mark the performance of the examinee instantly (each examiner independently) for each 'Topic' in percentage (%) in the appropriate columns of his/her copy of the card. For this s(he) uses the % range indicated for the column- U, S, G, E, or O (as mentioned in the card).
- Mark the performance of the examinee instantly (each examiner independently) for each of the 'Other practical performances' in absolute marks in the appropriate columns of his/her copy of the card.

What the examiners should do <u>after</u> the exam (in sequence)

Each Examiner:

- Calculates the average of the marks (in %) for all the topics in each 'Group' of the 'Oral part' of the card to show the performance in the Group and record it in the appropriate cell.
- Calculates and records the mean of these group percentages as the 'Overall performances' in the Oral Exam'.
- Records the 'Overall performance' marks for the Oral Exam from the '2nd Examiner's card, averages the two, and records the average as the 'Final marks' in the Oral Exam.
- Adds the marks in the 'Other practical performances' and puts the record in the appropriate cell of the card.
- Adds the marks in the OSPE and that in the 'Other practical performances' together to get the 'Overall performance' in the practical Exam.
- Records the 'Overall performance' marks for the Practical Exam from the '2nd Examiner's card, averages the two, and records the average as the 'Final marks' in the Practical Exam.
- Records the 'Final results' by putting tick marks in the 'Passed' or 'Failed' cell of the 'Oral part' and 'Practical part' of the card.
- Signs on each card at the appropriate locations.

A:17.2a Card for Oral-Practical Exam of Formative Block-1 Exams

Card no.....	Department of Anatomy, Bangabandhu Sheikh Mujib Medical University MS Anatomy, Phase- A, Year- 1, Summative Paper- I Exams **Card for Oral and Practical Exams**	**Session**..... **Roll no**.....

Approximate time– 30 min.				Total marks– 100 Overall pass marks– 60					
Group	**Compartment** *(For details, please see the course contents)*	**Tool** *	**Topic**	**Performance grade and marks**					
				Grade for topic † *(as% marks)*					Average marks for group
				U	**S**	**G**	**E**	**O**	
Group Ia: Introductory topics	a. History of Anatomy		1						
	b. Structure-function relationship		2						
	c. Relationships of anatomical knowledge & skills with everyday physical & mental activities								
Group Ib: Nomenclature & principles	Principles of anatomical nomenclature & spelling and English in Anatomy		3						
	Distinction between information and principle and generalisation of anatomical information / concepts		4						
Group II: Systemic anatomy	Spatial (topographical) and structural organisation of the human body in gross anatomical terms (including body positions & planes)		5						
	b. Bone, cartilage and Joint		6						
	c. Muscle		7						
	d. Cardiovascular, lympho-reticular and integumentary systems		8						
Group IIIa: Comparative anatomy & evolution of man	Basics of animal taxonomy and human's place in it		9						
	Basic concepts of the idea of human evolution and the challenges it faces								
	c. Basics of comparative anatomy		10						
Group IIIb: Preservation	a. Basic concepts of postmortem changes		11						
	Preservation of dead body & body parts / organs and modern embalming (including plastination)								
Group IV: Cell biology	Basic structural organisation of cell and its functional & clinical correlations		12						
	Protein synthesis, cell cycle, cell division and related anomalies		13						
Overall performance in the oral exams	Marks in this card- (*It will be calculated by averaging the marks obtained in all the compartments)*								.....
	Marks in 2nd examiner's card.....	Final (mean) marks	**Final result:** (√)	**Passed**.....					
				Failed.....					

* *Please use all types of tool (at least 2 figures/animations, 2 specimens / models/ skeletal component and 1diagnostic image)*

† *Please grade the answer to each topic by putting appropriate marks (in % value) in the respective column using the following key:*
***U**: Unsatisfactory (<60%); **S**: Sufficient (60-69%); **G**: Good (70-79%); **E**: Excellent (80-89%); **O:** Outstanding (90% or more)*

....
Signatures of the Examiners

(Continued on the next page for the practical part)

Page- 2

Card no……	**Department of Anatomy, Bangabandhu Sheikh Mujib Medical University** MS Anatomy, Phase- A, Year- 1, Summative Paper- I Exams **Card for Oral and Practical Exams**	Session…… Roll no……

Approximate time– 1 hour	**Practical Part**			Total marks- 100 Overall pass mark- 60	
Group	**Compartment** **(for details, please see the course contents)**	**Alloted marks**	**Selected topic, or ID no. of the selected problem**	**Performance marks**	
				For topic	For group
I: OSPE *(Time– 30 min)* 10 stations as per the supplied OSPE format	Eight 3-minute question stations	6x8= 48			
	Two 3-minute procedure stations	6x2= 12			
II: Other Practical performances	a. Teaching skill: 3-minute presentation ‡	10			
	b. Assessment skill	10			
	c. Drawing & labelling skill ‡	10			
	d. Problem-solving skill	10			
Overall performance in the practical exams	Marks in this card:……	Final (mean) marks ……		**Final result** (√)	**Passed**……
	Marks in 2nd examiner's card:……				**Failed**……

‡The topic for this compartment should be chosen from a supplied list.

…… ……
Signatures of the Examiners

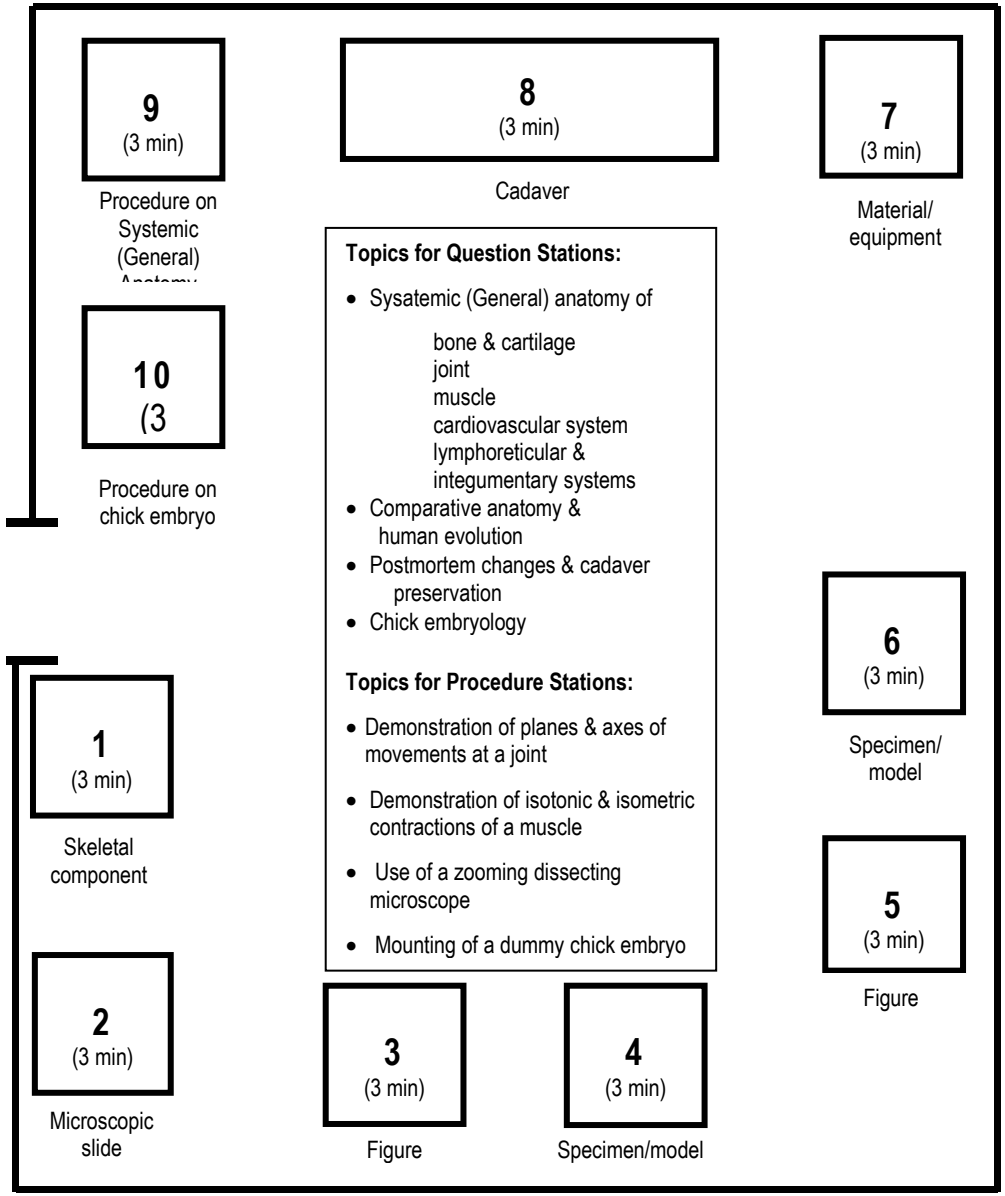
Copy of the Group: 'Other Practical Performances' of the Oral-Practical Card to be filled-out after lottery, and given to respective examinees

MS Anatomy Phase- A Year- 1 Summative Paper- I Exams **Other Practical Performances**	Session ……Roll no……

Compartment	**Allotted marks**	**Selected topic, or ID no. of the selected problem**	**Instruction to the resident**
1) Teaching skill	10		Ask for relevant tools you want to use. Prepare for the 3-min presentation. Present to the Examiners.
2) Assessment skill	10		Do as asked for (on the answer script).
3) Drawing & labelling skill	10		Draw and label (on the answer script).
4) Problem-solving skill	10		Prepare for the problem- solving. Produce the solutions to the Examiners.

A:17.2b OSPE Station Format Block-1 Exams

Department of Anatomy, Bangabandhu Sheikh Mujib Medical University
MS Anatomy. Phase- A, Year-1, Formative Block- 1
OSPE Station format



A:17.3a Card for Oral-Practical Exams of Summative Paper-I

Card no.....	Department of Anatomy, Bangabandhu Sheikh Mujib Medical University MS Anatomy, Phase- A, Year- 1, Summative Paper- I Exams **Card for Oral and Practical Exams**	**Session**..... **Roll no**…….

Approximate time– 30 min.				Total marks– 100 Overall pass marks– 60					
Group	**Compartment** *(For details, please see the course contents)*	**Tool** *	**Topic**	**Performance grade and marks**					
				Grade for topic † *(as% marks)*					Average marks for group
				U	**S**	**G**	**E**	**O**	
Group Ia: Introductory topics	a. History of Anatomy		1						
	b. Structure-function relationship		2						
	c. Relationships of anatomical knowledge & skills with everyday physical & mental activities								
Group Ib: Nomenclature & principles	Principles of anatomical nomenclature & spelling and English in Anatomy		3						
	Distinction between information and principle and generalisation of anatomical information / concepts		4						
Group II: Systemic anatomy	Spatial (topographical) and structural organisation of the human body in gross anatomical terms (including body positions & planes)		5						
	b. Bone, cartilage and Joint		6						
	c. Muscle		7						
	d. Cardiovascular, lympho-reticular and integumentary systems		8						
Group IIIa: Comparative anatomy & evolution of man	Basics of animal taxonomy and human's place in it		9						
	Basic concepts of the idea of human evolution and the challenges it faces								
	c. Basics of comparative anatomy		10						
Group IIIb: Preservation	a. Basic concepts of postmortem changes		11						
	Preservation of dead body & body parts / organs and modern embalming (including plastination)								
Group IV: Cell biology	Basic structural organisation of cell and its functional & clinical correlations		12						
	Protein synthesis, cell cycle, cell division and related anomalies		13						
Overall performance in the oral exams	Marks in this card- (*It will be calculated by averaging the marks obtained in all the compartments)*								…….
	Marks in 2nd examiner's card……	Final (mean) marks	**Final result:** (√)	**Passed**….. **Failed**…….					

* *Please use all types of tool (at least 2 figures/animations, 2 specimens / models/ skeletal component and 1diagnostic image)*

† *Please grade the answer to each topic by putting appropriate marks (in % value) in the respective column using the following key:*

***U**: Unsatisfactory (<60%); **S**: Sufficient (60-69%); **G**: Good (70-79%); **E**: Excellent (80-89%); **O:** Outstanding (90% or more)*

…… ……

Signatures of the Examiners

(Continued on the next page for the practical part)

Page- 2

Card no……..	**Department of Anatomy, Bangabandhu Sheikh Mujib Medical University** MS Anatomy, Phase- A, Year- 1, Summative Paper- I Exams **Card for Oral and Practical Exams**	Session..... Roll no….....

Approximate time– 1 hour	**Practical Part**			Total marks- 100 Overall pass mark- 60	
Group	**Compartment** **(for details, please see the course contents)**	**Alloted marks**	**Selected topic, or ID no. of the selected problem**	**Performance marks**	
				For topic	For group
I: OSPE *(Time– 30 min)* 10 stations as per the supplied OSPE format	Eight 3-minute question stations	6x8= 48			
	Two 3-minute procedure stations	6x2= 12			
II: Other Practical performances	a. Teaching skill: 3-minute presentation ‡	10			
	b. Assessment skill	10			
	c. Drawing & labelling skill ‡	10			
	d. Problem-solving skill	10			
Overall performance in the practical exams	Marks in this card:……	Final (mean) marks		**Final result** (√)	**Passed**.....
	Marks in 2nd examiner's card:……				**Failed**…….

‡The topic for this compartment should be chosen from a supplied list.

…… ……

Signatures of the Examiners

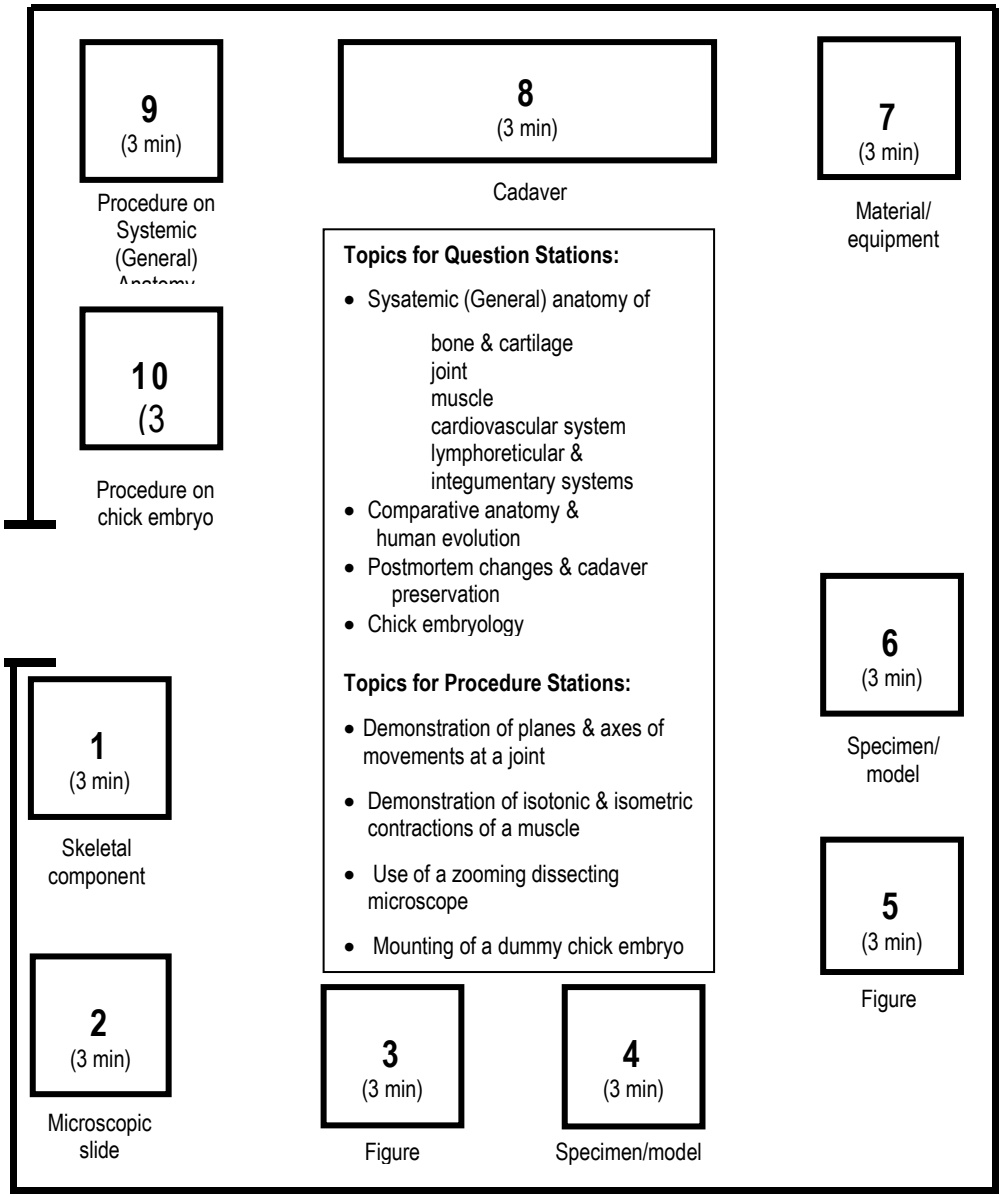
Copy of the Group: 'Other Practical Performances' of the Oral-Practical Card to be filled-out after lottery, and given to respective examinees

MS Anatomy Phase- A Year- 1 Summative Paper- I Exams **Other Practical Performances**	Session ……Roll no……

Compartment	**Allotted marks**	**Selected topic, or ID no. of the selected problem**	**Instruction to the resident**
1) Teaching skill	10		Ask for relevant tools you want to use. Prepare for the 3-min presentation. Present to the Examiners.
2) Assessment skill	10		Do as asked for (on the answer script).
3) Drawing & labelling skill	10		Draw and label (on the answer script).
4) Problem-solving skill	10		Prepare for the problem- solving. Produce the solutions to the Examiners.

A:17.3b OSPE Station Format for Summative Paper-I Exams

Department of Anatomy, Bangabandhu Sheikh Mujib Medical University
MS Anatomy. Phase- A, Year-1, Summative Paper-I Exams
OSPE Station format



A:17.4a Card for Oral-Practical Exams of Formative Block-2, Summative Paper-II

Card no. ……	Department of Anatomy, Bangabandhu Sheikh Mujib Medical University MS Anatomy, Phase- A, Year-1, Formative Block 2, Summative Paper-II Exams **Card for Oral Practical Exams**	**Session**…… **Roll no**. ……

Approx. time: 30 min.		Total marks– 100 Overall pass marks– 60

Group	**Compartment** *(For details, please see the course contents)*	**Tool***	**Topic**	**Performance grade & marks**					
				Grade for topic† *(as % marks)*					Average marks for group
				U	**S**	**G**	**E**	**O**	
Group I	a. Introductory topic:		1						
	b. Mitosis, meiosis & gametogenesis. fertilization and pre-embryonic period or germinal period		2						
	c. Gastrulation and foetal period		3						
	d. Anatomy of pregnancy & parturition, multiple pregnancy and related anomalies, General Teratology		4						
Group II	a. Neonatal Anatomy: principal features differing from the adult features, postnatal growth & development		5						
	b. Basics of fertility & assisted reproduction		6						
	c. Physical Anthropology, Forensic Anatomy, determination of age & sex, the idea of human race in anatomical science		7						
Group III	a. Chromosome: structure, study, classification, anomalies & their mechanisms, homologous chromosomes. DNA, RNA, gene, allelic and non-allelic genes, protein synthesis & gene expression.		8						
	b. Mendel's laws, inheritance patterns, genetic disorders & genetic counseling		9						
	c. Gene mutation, recombinant DNA technology, Basics of population genetics, pharmacogenetics, immunogenetics, cancer genetics & ecogenetics		10						

Overall performance in the oral exams	Marks in this card (*It will be calculated by averaging the marks obtained in all the compartments*)			……
	Marks in 2nd examiner's card ……	Final (mean) marks…… ……	**Final result** (√)	**Passed**…… **Failed**……

* *Please use all types of tool (at least 2 figures, 2 specimens / models /skeletal component and 1diagnostic image.)*
† *Please grade the answer to each topic by putting appropriate marks (in % value) in the respective column using the following key:*
***U**: Unsatisfactory (<60%); **S**: Sufficient (60-69%); **G**: Good (70-79%); **E**: Excellent (80-89%); **O:** Outstanding (90% or more)*

Signatures of the Examiners

(Continued on the next page for the practical part)

Card no……	**Department of Anatomy, Bangabandhu Sheikh Mujib Medical University** MS Anatomy, Phase- A, Year- 1, Summative Paper- I Exams **Card for Oral and Practical Exams**	Session…… Roll no……

Approximate time– 1 hour	**Practical Part**	Total marks- 100 Overall pass mark- 60

Group	**Compartment** **(for details, please see the course contents)**	**Alloted marks**	**Selected topic, or ID no. of the selected problem**	**Performance marks**	
				For topic	For group
I: OSPE *(Time– 30 min)* 10 stations as per the supplied OSPE format	Eight 3-minute question stations	6x8= 48			
	Two 3-minute procedure stations	6x2= 12			
II: Other Practical performances	a. Teaching skill: 3-minute presentation ‡	10			
	b. Assessment skill	10			
	c. Drawing & labelling skill ‡	10			
	d. Problem-solving skill	10			
Overall performance in the practical exams	Marks in this card:……	Final (mean) marks ……		**Final result** (√)	**Passed**……
	Marks in 2nd examiner's card:……				**Failed**……

‡The topic for this compartment should be chosen from a supplied list.

…… ……
Signatures of the Examiners

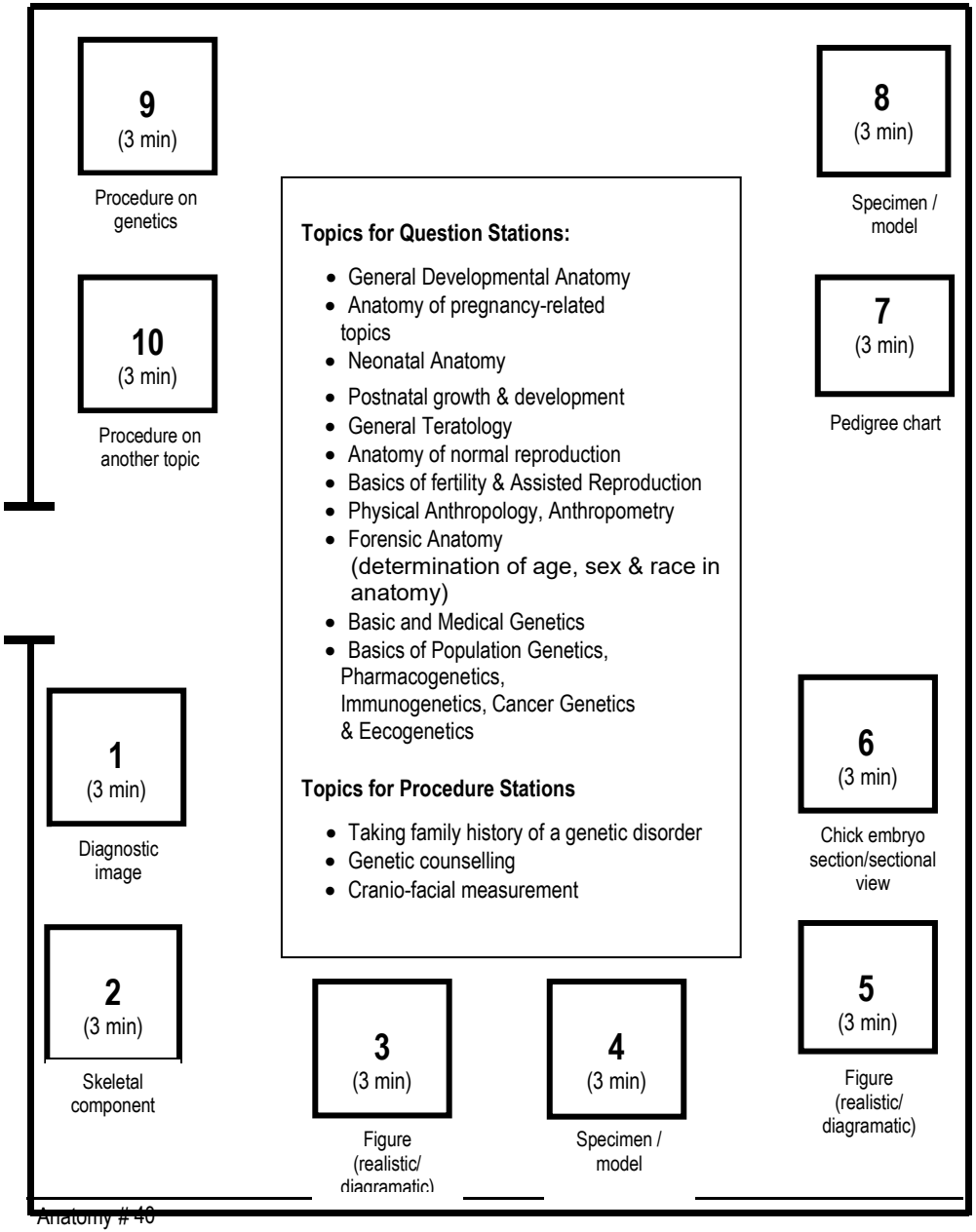
Copy of the Group: 'Other Practical Performances' of the Oral-Practical Card to be filled-out after lottery, and given to respective examinees

MS Anatomy Phase- A Year- 1 Formative Block- 2, Summative Paper-II Exams **Other Practical Performances**	Session ……Roll no……

Compartment	**Allotted marks**	**Selected topic, or ID no. of the selected problem**	**Instruction to the resident**
1) Teaching skill	10		Ask for relevant tools you want to use. Prepare for the 3-min presentation. Present to the Examiners.
2) Assessment skill	10		Do as asked for (on the answer script).
3) Drawing & labelling skill	10		Draw and label (on the answer script).
4) Problem-solving skill	10		Prepare for the problem-solving & then produce the solutions to the examiners.

A:17.4b OSPE Station Format for Formative Block-2, Summative Paper-II Exams

Department of Anatomy, Bangabandhu Sheikh Mujib Medical University
MS Anatomy. Phase- A, Year-1, Formative Block- 2, Summative Paper-II Exams
OSPE Station format



A:17.5a Card for Oral-Practical Exams of Formative Block-3, Summative Paper-III

Card no.……	Department of Anatomy, Bangabandhu Sheikh Mujib Medical University MS Anatomy, Phase- A, Year-1, Formative Block-3, Summative Paper-III Exams **Card for Oral Practical Exams**	Session..... Roll no. .....

Approx. time: 30 min.		Total marks– 100 Overall pass marks– 60

Group	**Compartment** *(For details, please see the course contents)*		**Part or system of body** *	**Tool** †	**Topic**	**Performance grade & marks**					
						Grade for topic ‡ *(as % marks)*					Average marks for group
						U	**S**	**G**	**E**	**O**	
Group I General histology	a. Histologic techniques				1						
	b. Microscopy				2						
	c. Histology of the basic tissues				3						
Group II Anatomy of abdomen, pelvis or perineum	a. Basic anatomy of specific organ / part	i. Bone / skeleton			4						
		ii. Viscus / figure / model / prosected specimen			5						
	b. Relevant blood supply / lymph drainage / nerve supply				6						
	c. Relevant developmental anatomy (including anomaly)				7						
	d. Relevant systemic histology				8						
Group III	a. Anatomy of a physiological process				9						
	b. Anatomy of a clinical procedure				10						
	c. Anatomy of a clinical disorder				11						

Overall performance in the oral exams	Marks in this card (*It will be calculated by averaging the marks obtained in all the compartments)*			.....
	Marks in 2nd examiner's card	Final (mean) marks	**Final result** (√)	**Passed**..... **Failed**.....

* Use the following codes;

A: Abdomen, GH**:** General histology, **P**: Pelvis/perineum, **D:** Digestive, **U**: Urinary, **R:** Reproductive, **M**: Musculoskeletal, **V**: Vascular, **L:** Lymphoreticular, **N**: Nervous.
Therefore, **P-U** would mean "Pelvic region & urinary system".

† Please use every type of tool. *(at least 2 figures/animations, 2 specimens / models/ skeletal component and 1 diagnostic image)*

‡ Please *grade the answer to each topic by putting appropriate marks (in % value) in the respective column using the following key* :

U: Unsatisfactory (<60%); **S:** sufficient (60-69%); **G:** Good (70-79%); **E**: Excellent (80-89%); O**:** Outstanding (90% or more)

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Signatures of the Examiners

(Continued on the next page for the practical part)

Card no.	**Department of Anatomy, Bangabandhu Sheikh Mujib Medical University** MS Anatomy, Phase- A, Year- 1, Formative Block-3, Summative Paper-III Exams **Card for Oral and Practical Exams**	Session..... Roll no.....

Approximate time– 1 hour	**Practical Part**	Total marks-100 Overall pass mark- 60

Group	**Compartment (for details, please see the course contents)**	**Alloted marks**	**Part or system of the body***	**Selected topic, or ID no. of the selected problem**	**Performance marks**	
					For topic	For group
I: OSPE *(Time– 30 min)* 10 stations as per the supplied OSPE format	Eight 3-minute question stations	6x8= 48				
	Two 3-minute procedure stations	6x2= 12				
II: Other practical performances	a. Teaching skill: 3-minute presentation **	6				
	b. Microscopic study skill (x40, x100 etc.)	5x2= 10		*Self-made:*		
				Another:		
	c. Drawing & labelling skill **	6				
	d. Problem-solving skill	6				
	e. Cadaver-related anatomy	6x2= 12		Overall:		
				Selected:		

Overall performance in the practical exams	Marks in this card:.....	Final (mean) marks.....	**Final result** (√)	**Passed**.....
	Marks in 2nd examiner's card:.....			**Failed**.....

** The topics for these compartments should be chosen from supplied lists.

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Signatures of the Examiners

Copy of the Group: 'Other Practical Performances' of the Oral-Practical Card to be filled-out after lottery, and given to respective examinees

MS Anatomy Phase- A Year- 1 Formative Block- 3, Summative Paper- III Exams Other Practical Performances	Session ……..Roll no..

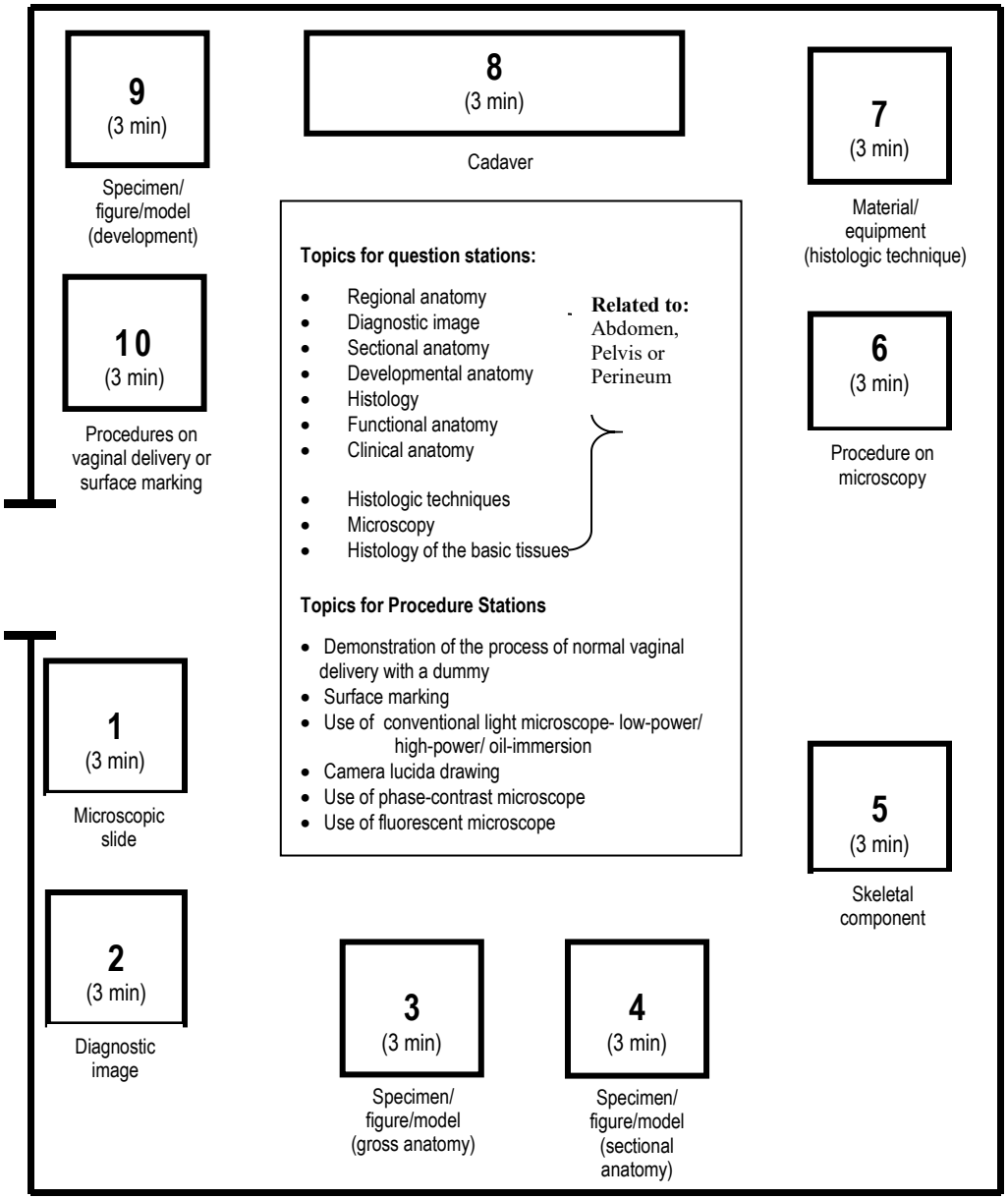
Compartment	**Allotted marks**	**Selected topic, or ID no. of the selected problem**	**Instruction to the residents**
1) Teaching skill	6		Ask for relevant tools you want to use. Prepare for the 3-min presentation. Present to the Examiners
2) Microscopic study skill (×40, ×100 etc.)	5×2=10	Self-made: Another:	Demonstrate the skill to the Examiners.
3) Drawing & labelling skill	6		Draw and label (on the answer script).
4) Problem-solving skill	6		Prepare for the problem- solving. Produce the solutions to the Examiners.
5) Cadaver-identification skill	6×2=12	Overall: Selected:	Demonstrate the skill to the Examiners.

A:17.5b OSPE Station Format for Formative Block-3, Summative Paper-III Exams

Department of Anatomy, Bangabandhu Sheikh Mujib Medical University

MS Anatomy. Phase- A, Year-1, Formative Block- 3, Summative Paper-III Exams

OSPE Station format



A:17.6a Card for Oral-Practical Exams of Formative Block-4, Summative Paper-IV

Card no.	Department of Anatomy, Bangabandhu Sheikh Mujib Medical University MS Anatomy, Phase-A, Year-2, Formative Block-4 / Summative Paper-IV Exams **Card for Oral Practical Exams**	**Session**..... **Roll no**. .....

Approx. time: 30 min.		Total marks– 100 Overall pass marks– 60

Group	**Compartment** *(For details, please see the course contents)*	**Subject *** Neuro-anatomy	**Subject *** Head & Neck	**Tool †**	**Topic**	**Performance grade & marks** Grade for topic ‡ *(as % marks)* U	S	G	E	O	Average marks for group
Group I	a. Basic anatomy (Using bone / skeleton/ viscus / figure / model/ prosected specimen)		√		1						
	b.Neuroanatomy	√			2						
Group II	a. Artery supply / venous drainage / lymphatic drainage / nerve supply				3						
	b. Head-neck developmental anatomy / developmental anatomy of nervous system (plus anomalies)				4						
	c. Head-neck histology / neurohistology				5						
Group III	a. Motor system / sensory system	√			6						
	b. Nerve plexuses and cranial / spinal nerves	√			7						
	c. ANS / hypothalamus / limbic system	√			8						
Group IV	a. Anatomy / neuroanatomy of a physiological process				9						
	b. Anatomy / neuroanatomy of a clinical procedure				10						
	c. Anatomy / neuroanatomy of a clinical disorder				11						

Overall performance in the oral exams	Marks in this card (*It will be calculated by averaging the marks obtained in all the compartments*)			…….
	Marks in 2nd examiner's card …….	Final (mean) marks ……	**Final result** (√)	**Passed**..... **Failed**.....

……. …….

Signatures of the Examiners

* Please tick in one column for each compartment. Some compartments have already been tick-marked.
For the rest of the compartments-
Please select 7 (seven) topics from Neuroanatomy and 4(four) topics from Head & Neck.

† Please use every type of tool *(at least 2 figures/animations, 2 specimens/ models/ skeletal components and 1 diagnostic image).*

‡ For grading, please put the mark as a percentage in the appropriate grade column:

U: Unsatisfactory (<60%); **S**: Sufficient (60-69%); **G**: Good (70-79%); **E:** Excellent (80-89%); **O**: Outstanding (90% or more).

Page- 2

Card no. ……	**Department of Anatomy, Bangabandhu Sheikh Mujib Medical University** MS Anatomy, Phase- A, Year- 2, Formative Block- 4, Summative Paper-IV Exams **Card for Oral and Practical Exams**	Session..... Roll no….....

Approximate time– 1 hour	**Practical Part**			Total marks- 100 Overall pass mark- 60

Group	**Compartment** (for details, please see the course contents)	**Alloted marks**	**Subject*** Neuro	**Subject*** H & N	**Selected topic, or ID no. of the selected problem**	**Performance marks** For topic	For group
I: OSPE (Time– 30 min) 10 stations as per the supplied OSPE format	Eight 3-minute question stations	6x8= 48					
	Two 3-minute procedure stations	6x2= 12					
II: Other practical performances	a. Teaching skill: 3-minute presentation **	6					
	b. Microscopic study skill	5x2=10			Self-made:		
					Another:		
	c. Drawing & labelling skill **	6					
	d. Problem-solving skill	6					
	e. Cadaver-oriented anatomy	6x2=12			Overall :		
					Selected:		

Overall performance in the practical exams	Marks in this card:……	Final (mean) marks.....	**Final result** (√)	**Passed** ..
	Marks in 2nd examiner's card:……			**Failed** …

** The topics for these compartments should be chosen from supplied lists.

Copy of the Group: 'Other Practical Performances' of the Oral-Practical Card to be filled-out after lottery, and given to respective examinees

MS Anatomy Phase- A Year- 2 Formative Block- 4, Summative Paper- IV Exams Other Practical Performances	Session .....Roll no.....

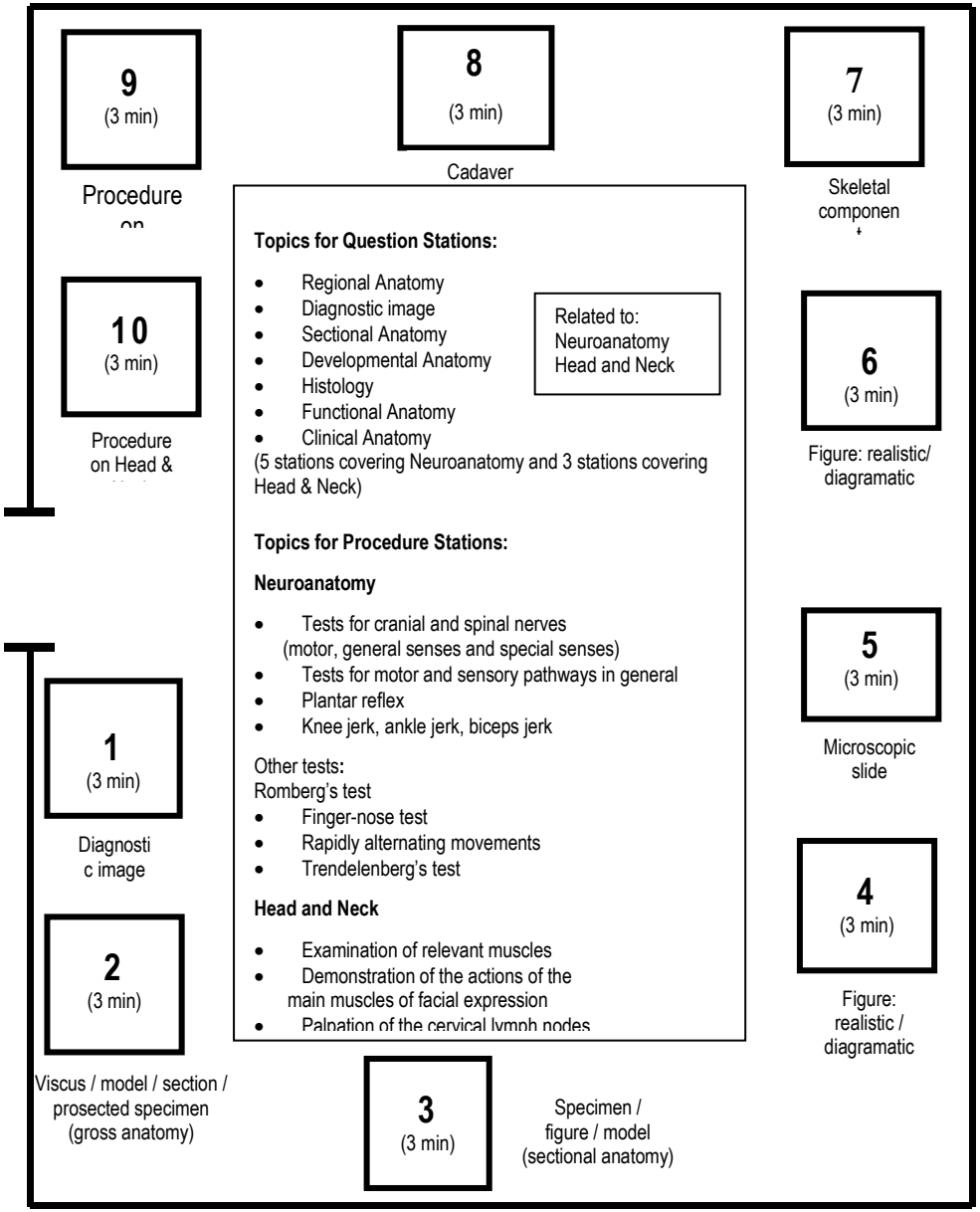
Compartment	**Allotted marks**	**Selected topic, or ID no. of the selected problem**	**Instruction to the residents**
1) Teaching skill	6		Ask for relevant tools you want to use. Prepare for the 3-min presentation. Present to the Examiners
2) Microscopic study skill (×40, ×100 etc.)	5×2=10	Self-made: Another:	Demonstrate the skill to the Examiners.
3) Drawing & labelling skill	6		Draw and label (on the answer script).
4) Problem-solving skill	6		Prepare for the problem- solving. Produce the solutions to the Examiners.
5) Cadaver-identification skill	6×2=12	Overall:	Demonstrate the skill to the Examiners.

A:17.6b OSPE Station Format for Formative Block-4, Summative Paper-IV Exams

Department of Anatomy, Bangabandhu Sheikh Mujib Medical University

MS Anatomy. Phase- A, Year- 2, Formative Block-4, Summative Paper- IV Exams

OSPE Stations format



A:17.7a Card for Oral-Practical Exams of Formative Block-5, Summative Paper-V

Card no.	Department of Anatomy, Bangabandhu Sheikh Mujib Medical University MS Anatomy, Phase- A, Year- 2, Formative Block- 5, Summative Paper- V Exams **Card for Oral and Practical Exams**	**Session**..... **Roll no.** .....

Approx. time: 30 min.		Total marks– 100 Overall pass mark– 60

Group	Compartment *(For details, please see the course contents)*	Part of body *	Tool †	Topic	Performance grade & marks: Grade for topic ‡ *(as % marks)* U	S	G	E	O	Average marks for group
Group I	a. Terms related to Thorax (including breast), back and vertebral column, Superior Extremity & Inferior Extremity			1						
	b. Organ- location, anatomical position, gross features, relations			2						
	c. Blood supply / lymphatic drainage			3						
GroupII	a. Muscle- origin, insertion, action, nerve supply.			4						
	b. Joint- formation, type, movements & others			5						
Group III	a. Development & developmental anomalies			6						
	b. Features of specific cells / tissues / organs- (covering LM, EM & other methods)			7						
				8						
Group IV	a. Anatomy of a physiological process			9						
	b. Anatomy of a clinical procedure			10						
	c. Anatomy of an acquired clinical disorder			11						

Overall performance in the oral exams	Marks in this card (*It will be calculated by averaging the marks obtained in all the compartments*)			.....
	Marks in 2nd examiner's card	Final (mean) marks	**Final result** (√)	**Passed** ..... **Failed** .....

* *Please put these key words in this column:* ***T****: Thorax;* ***SE****: Superior extremity;* ***IE****: Inferior extremity.*

† *Please use all types of tool (at least 2 figures/animations, 2 specimens/models/skeletal components &1 diagnostic image)*

‡ *For grading, please put a % in the appropriate column using the following key:* ***U*** *(Unsatisfactory) : <60%;*
S *(Sufficient): 60-69%;* ***G*** *(Good): 70-79%;* ***E*** *(Excellent): 80-89%;* ***O*** *(Outstanding): 90% or more.*

....
Signatures of Examiners

Page- 2

Card no.	**Department of Anatomy, Bangabandhu Sheikh Mujib Medical University** MS Anatomy, Phase- A, Year- 2, Formative Block- 5, Summative Paper- V Exams **Card for Oral and Practical Exams**	Session..... Roll no..... .....

Approximate time– 1 hour	**Practical Part**	Total marks- 100 Overall pass mark- 60

Group	Compartment (for details, please see the course contents)	Alloted marks	Selected topic, or ID no. of the selected problem	Performance marks: For topic	For group
I: OSPE *(Time– 30 min)* 10 stations as per the supplied OSPE format	Eight 3-minute question stations	6x8=48			
	Two 3-minute procedure stations- 1 gross, 1 histological	6x2=12			
II: Other practical performances	a. Teaching competency- 3-min presentation**	6			
	b. Microscopic study skill	5x2=10	Self-made:		
			Another:		
	c. Drawing & labelling skill **	6			
	d. Problem-solving skill	6			
	e. Cadaver-oriented anatomy	6x2=12	Overall:		
			Selected:		
Overall performance in the practical exams	Marks in this card: ..... Marks in 2nd examiner's card:	Final (mean) marks.....		**Final result** (√)	**Passed**:..... **Failed**:.....

***The topics for these compartments should be chosen from supplied lists.*

....

Signatures of Examiners

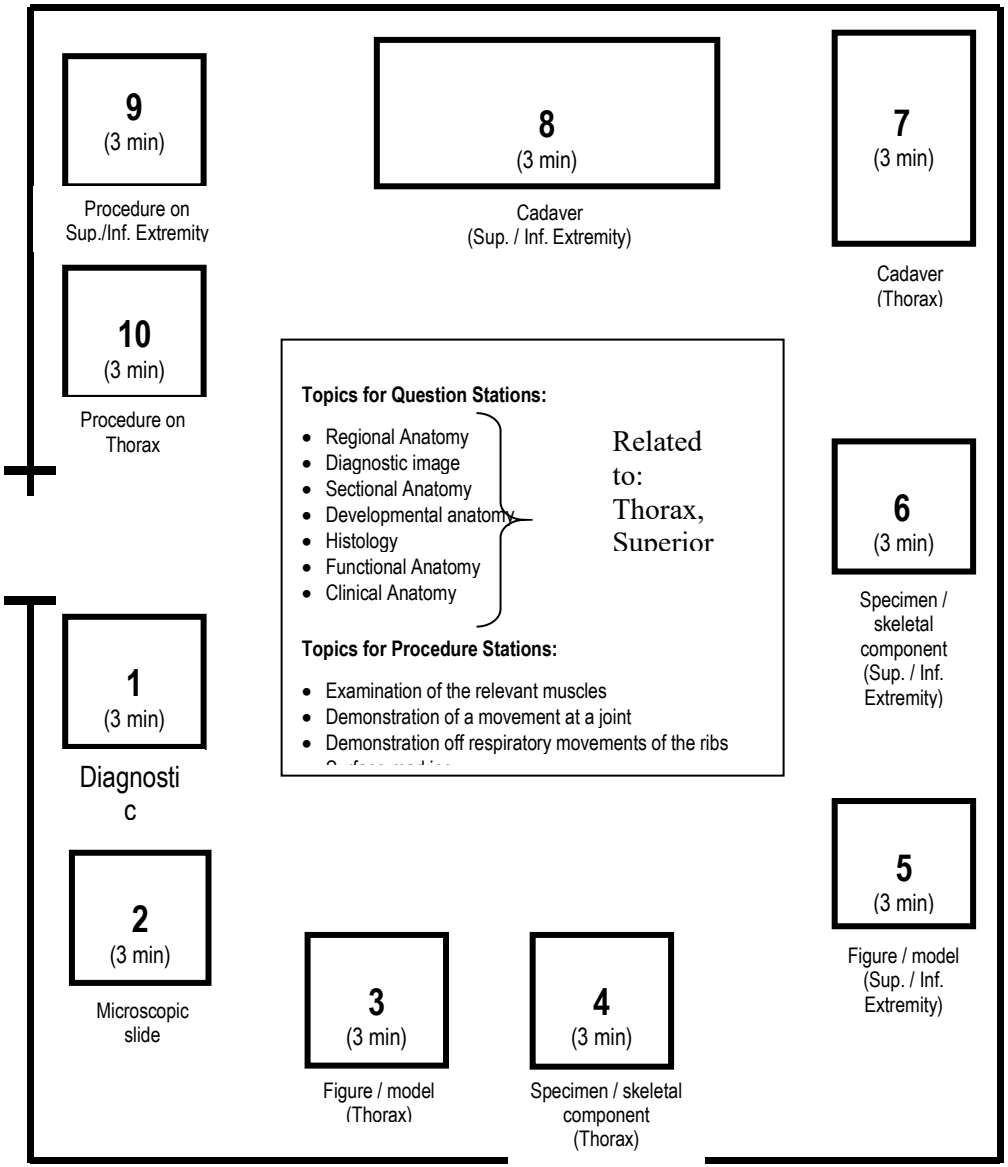
Copy of the Group: 'Other Practical Performances' of the Oral-Practical Card to be filled-out after lottery, and given to respective examinees

MS Anatomy Phase- A Year- 2 Formative Block- 5, Summative Paper- V Exams Other Practical Performances	Session ……..Roll no…..

Compartment	**Allotted marks**	**Selected topic, or ID no. of the selected problem**	**Instruction to the residents**
1) Teaching skill	6		Ask for relevant tools you want to use. Prepare for the 3-min presentation. Present to the Examiners
2) Microscopic study skill (×40, ×100 etc.)	5×2=10	Self-made: Another:	Demonstrate the skill to the Examiners.
3) Drawing & labelling skill	6		Draw and label (on the answer script).
4) Problem-solving skill	6		Prepare for the problem- solving. Produce the solutions to the Examiners.
5) Cadaver-identification skill	6×2=12	Overall:	Demonstrate the skill to the Examiners.

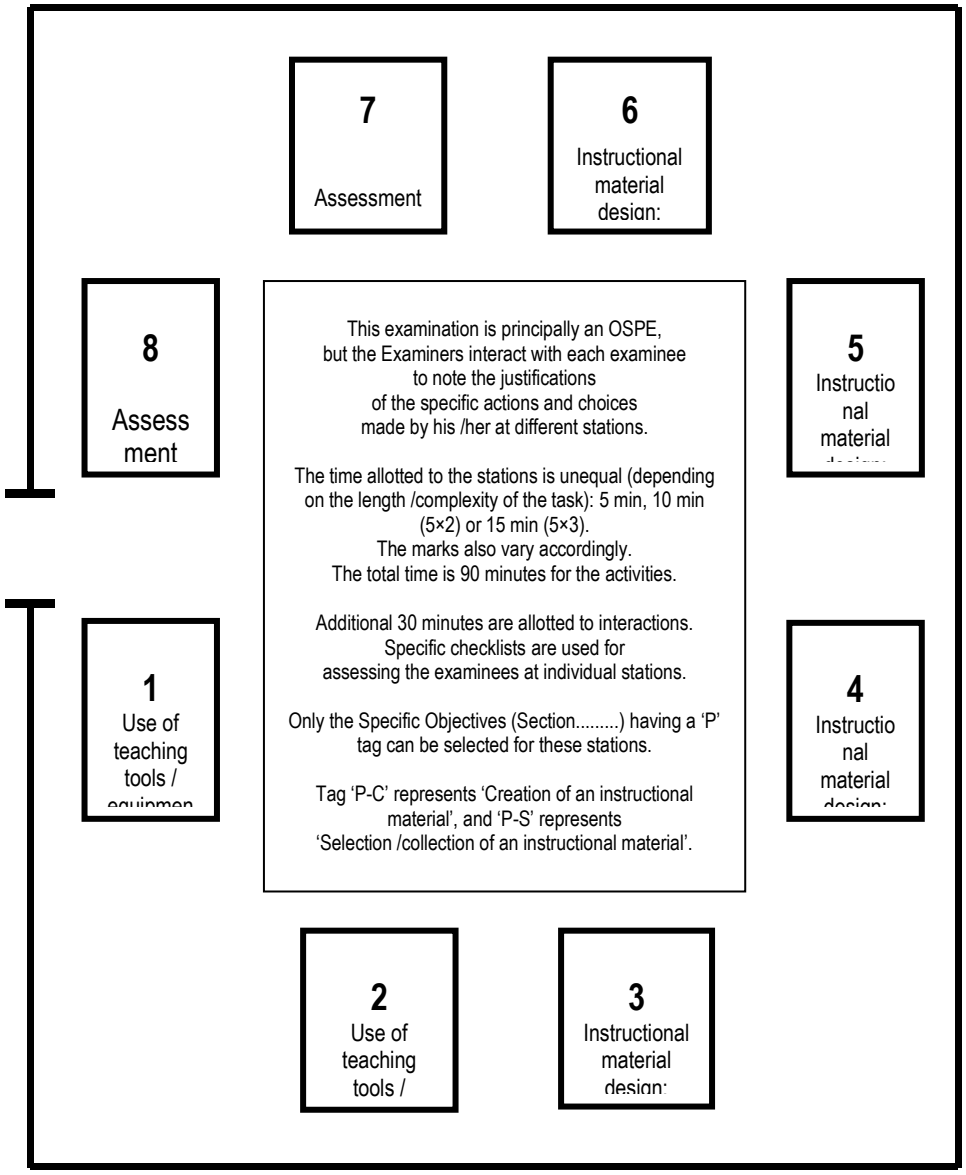
A.17.7b OSPE Station Format for Formative Block-5 Summative Paper-V Exams

Department of Anatomy, Bangabandhu Sheikh Mujib Medical University
MS Anatomy. Phase- A, Year-2, Formative Block- 5, Summative Paper-V Exams
OSPE Station format



A: 17.8 OSPE Station Format for Formative Block-6 summative Paper-VI Exams

Department of Anatomy, Bangabandhu Sheikh Mujib Medical University
MS Anatomy. Phase- A, Year-2, Formative Block- 6, Summative Paper-VI Exams
Interactive Practical Exam format



B. DETAILS OF THE COURSE: Phase- A

B:1 Phase- A Year- 1 Block- 1 (PAY1B1)

B:1.1 Introduction to Anatomy as a Science

Specific Objectives

After completing this part of the block, the residents should be able to:

(Knowledge)

- Demonstrate the basic understanding of the evolution of medical science as a scientific discipline and its implications in individual and social wellbeing of man.
- Demonstrate a proper understanding of what Anatomy is as a scientific discipline and what its importance and limitations are in the context of medical science.
- Name the different subdivisions of Anatomy and differentiate one from another and explain the importance of each in the learning and teaching of Anatomy as a medical science.
- Describe the principal events in the history of Anatomy and demonstrate the understanding of the implications of these events in the development of medical science.
- Demonstrate the understanding of what is expected of an MS Anatomy degree-holder by students, by others, by the country and by the world as a whole as a teacher and a researcher as well as a consultant in education and health-related decision-making.
- Demonstrate the understanding of why and how anatomical knowledge and skills should be freed from a theoretical approach or stereotypical practical activity in order to link it to everyday physical and mental activities, and show the drive for using that understanding in the learning and teaching in Anatomy.
- Demonstrate the understanding of the importance of correlating each structural component of the body with its specific functions in different perspectives, and show the drive for drawing such relationship in the learning and teaching in Anatomy.
- Demonstrate the understanding of how anatomical knowledge and skill can be correlated with clinical procedures, imaging and disorders, and show the ability to use such clinically-oriented approach in the learning and teaching in Anatomy.
- Demonstrate the appreciation of the value of a basic but comprehensive and interlinked knowledge and understanding of different fields of science, art, literature, music, social sciences, history, philosophy, sport etc. in life of an anatomist as a teacher, researcher and consultant.
- Draw relevant analogies from the above fields to make anatomical information and concepts more understandable.
- Demonstrate the attitude and ability to work in teams with peer students and others in the department.
- Explain (with examples) the principles of anatomical nomenclature and spelling and analyse every anatomical term using those principles.

- Demonstrate the ability to understand the English used in the Anatomy textbooks and to express anatomical concepts and information using own English.
- Distinguish between anatomical information (memorising) and anatomical principle (understanding).
- Identify principles and cite examples to fit them.
- Identify similar information / concepts.
- Distinguish between dissimilar things / concepts.
- Draw analogy of anatomical and non-anatomical structure / phenomenon / concept
- Identify and explain (with examples) the basic anatomical principles and utilise them in understanding, organising, explaining and interrelating newly gathered anatomical information and concepts in the learning and teaching in Anatomy.
- Describe the basic spatial (topographical) and structural organisation of the human body in gross anatomical terms and explain the significance of the organisation with examples.
- Identify similar information/concepts as opposed to dissimilar ones in analogy for generalisation.

(Skill)

- Identify and explain (with examples) the basic anatomical principles and utilize them in understanding, organising, explaining and interrelating newly gathered anatomical information and concepts in the learning and teaching in Anatomy.

(Attitude)

- Explain why and demonstrate how to use one's own body or others' living bodies, cadavers, prosected specimens, skeletons, models and different forms of illustration (as laminated printouts, OHP transparencies, static multimedia slides, animated multimedia slides) and videos in the learning and teaching in Anatomy.
- Demonstrate proper attitude of relating structure to function & vice versa.
- Demonstrate compassion while dealing with chick embryos and adequate respect to the price of the embryos have to pay for ensuring our learning.
- Demonstrate the feeling that while Anatomy is an important discipline, other disciplines are also important, and giving proper value to different disciplines in appropriate places ensures the utility of each.
- Demonstrate an understanding of the value of integration among different subdivisions of Anatomy and between Anatomy and other disciplines is a must for appropriate use of each.
- Demonstrate appropriate humbleness, confidence, flexibility, conviction and professionalism in considering the place of Anatomy in medical science.
- Demonstrate preference to evidence rather than to beliefs while deciding on debatable issues in Anatomy.
- Demonstrate passion for using reason, logic and generalisation in understanding and using anatomical terms.
- Demonstrate the eagerness and efforts to use easy, understandable and non-bookish language, not hesitating to use Bangla, in ensuring understanding the listener.

- Demonstrate the understanding of the importance of properly customised approach in teaching and assessment in Anatomy as applicable to the undergraduate and postgraduate levels as well as to different clinical disciplines.

Course Content

- Anatomy as a scientific discipline
- Sub-divisions of Anatomy and their importance
- Brief history of Anatomy
- The role of a career Anatomist as a professional
- The modern approach towards Anatomy
- Use of learning materials in Anatomy
- Structures- function relationship
- Clinical correlation of anatomical knowledge and skills
- Value of extra-anatomical interest and knowledge in the life a career Anatomist.
- Anatomical nomenclature and spelling
- English used in Anatomy
- General principles of Anatomy and their uses

Educational Strategy

As outlined in Section A-10 and as applicable

Learning Methods

As outlined in Section A-10 and as applicable

Assessment

As outlined in Section A-14 and as applicable

B:1.2 Principles of Comparative Anatomy (PAY1B1)

Specific Objectives

After completing this part of the block, the residents should be able to:

(Knowledge)

- Mention the basic principles of comparative anatomy following which the human being can be properly placed (identified) in the taxonomy of the animal kingdom.
- Compare the principal features of the vertebrates, mammals, primates and humans.
- Compare the human being with representative animals in the taxonomy of the animal kingdom to highlight the main structural similarities (homology and analogy) and dissimilarities and relate them to their functional implications.
- Outline the basic concepts in the idea of evolution of the human being and the scientific challenges the idea faces.
- Explain how ontogeny repeats in phylogeny.

(Skill)

- Identify different parts of a hen's egg.
- Draw and label different parts of a hen's egg.
- Prepare whole mounts of chick embryos of different ages, identify different parts of the embryos under microscope and compare them with the relevant parts of the human embryo.
- Draw and label different parts of chick embryo whole mounts at different ages.
- Set a dissecting microscope, identify different parts of embryological slides under it (correlated with their functions) and determine the age of embryo.

(Attitude)

- Demonstrate proper attitude of putting human being in the broader context of the animal kingdom, and developing an understanding of the differences among animals in terms of functional needs rather than in terms of superiority of one species over another.
- Demonstrate proper attitude of addressing the question of evolution with a scientific mind.

Course Content

- Basic principles of Comparative Anatomy
- Basics of the taxonomy of the animal kingdom and the human being place in it
- Principal features of the vertebrates, mammals, primates and humans and the features that distinguish one from another
- Important structural similarities and dissimilarities between the humans and representative animals in the taxonomy of the animal kingdom
- Basic idea of evolution of human being and the scientific challenges the idea faces.
- Parts of a hen's egg
- Structural features of the developmental stages of chick embryo in whole mount

Special placement

Place(s) where

- resource person(s) with specialised knowledge of Comparative Anatomy and the question of human evolution are available
- exposure to relevant specimens/figures is possible

Educational Strategy

As outlined in section A-10 and as applicable

Learning Methods

As outlined in section A-10 and as applicable

Assessment

As outlined in section A-14 and as applicable

B:1.3 Basic Topographical & Structural Organisation of the Human Body and Human Systemic Anatomy (General Anatomy)

Specific Objectives

After completing this part of the Block, the residents should be able to:

(Knowledge)

General

- Define and differentiate between important terms related to the basic topographical and structural organisation of the human body and human systemic Anatomy.
- Explain the basic principles of systemic organisation of the human body with examples in developing a holistic approach to Anatomy.
- Explain the basic principles of the following body systems (citing examples of each):
  - Musculoskeletal
  - Cardiovascular system
  - Lymphoreticular system
  - Integumentary system

- Describe the anatomical concepts and information related to the above systems and correlate them with the relevant functional and clinical aspects.
- Generalise anatomical information & concepts.

Musculoskeletal system

Bone and cartilage

- Give an overview of the skeletal system.
- Define bone and cartilage.
- Differentiate bone form cartilage.
- Explain the particular features that make bone and cartilage specialised connective tissues.
- Explain the clinical implications of the musculoskeletal system.
- Describe the structural components and organisation of bone.
- Describe diffent parts of long bone.
- Define ossification.
- Differentiate between calcification and ossification.
- Explain the importance of systemic and local factors in bone formation and maturation.
- Discuss the importance, locations and process of intramembranous ossification.
- Discuss the importance, locations and process of intracartilagnous ossification.
- Differentiate between primary and secondary centres of ossification with examples (in term of location, appearance and importance).
- Define the growing end of a long bone and explain its importance.
- Define epiphysis.
- Differentiate between various types of epiphyses.
- Explain the functional anatomy of force transmission through bone, with examples.
- Classify bone with examples.
- Differentiate between the features of different morphological types of bone and explain their functional importance.
- Differentiate compact bone from cancellous bone.
- Describe the location, morphology and major functions of the bone cells. (to be detailed againin Basic Histology)
- Discuss the features of a growing bone.
- Explain importance of metaphysis.
- Discuss how different types of bone and cartilage get their nutrition.
- Explain how the bone gets its mature form (remodeling of bone).
- Describe bone marrow.
- Differentiate between different types of cartilage explaining their functional importance.
- Describe the structure of periosteum and perichondrium and explain their functions.
- Discuss the peculiarities of the cartilage.

- Describe the histogenesis of cartilage.

Joint

- Define joint.
- Classify joint from different perspectives, with examples.
- Differentiate between various types of joint and explain the functional significance of each.
- Describe the features of a synovial joint.
- Classify synovial joint.
- Explain the mode of blood supply to a joint and the importance of anastomoses around joints.
- Describe the component parts of a synovial joint and explain their functions:
    - Synovial fluid and synovial membrane
    - Articular capsule
    - Ligaments
    - Articular discs
- Describe synovial bursa and explain its functional & clinical implications.
- Discuss the factors limiting the range of movements and factors maintaining the stability of different joints with examples.
- Explain important aspects of kinesiology.
- Describe and explain the development of different types of joint

Muscle

- Classify muscles morphologically and functionally with examples.
- Describe the parts of a voluntary muscle.
- Explain the nomenclature of skeletal muscle.
- Classify skeletal/voluntary muscles, from different perspectives and gives examples
- Explain muscle contraction.
- Define and explain the importance of muscle origin and insertion.
- Explain how fibre directions determine muscle actions citing examples.
- Explain how a muscle can have different effects working from its origin and from its insertion.
- Describe tendon sheath and explain its functional and clinical implications.
- Differentiate between myo-epithelial cells & myocyte.

Cardiovascular system

- Classify circulation.
- Describe different type of arteries with their function.
- Define capillaries. Describe the features and types of capillary system.
- Differentiate between sinusoids and cavernous tissues.

- Describe different types of venous system.
- Restate the types of portal circulation.
- Explain the function and clinical significance of portal circulation.
- Define and classify end artery.
- Discuss the structural features, functional and clinical significance of atypical veins.
- Describe the functional and clinical significance of azygos system of veins, vertebral venous plexuses, soleal venous plexus and perforating veins of limbs.
- Explain the anatomical basis of spread of malignancy from prostate to distant sites.
- Mention the sites and importance of venegraft.
- Discuss the importance of collateral circulation.
- Summarise the function of venous valves.
- Describe the factors influencing venous return with their clinical consequence.
- Explain the functional significances of vascular shunts.
- Define anastomosis.
- Explain the importance of anastomoses with their clinical consequences.
- Discuss the functional importance of different blood barriers.
- Justify the anatomical and clinical consequences of arteries in – hypertension, atherosclerosis, aneurysm.
- Explain why arterial anastomoses are common near the joints.
- Describe the blood supply and nerve supply of blood vessels.

Lymphatic system

- Define lymph.
- Describe the components of lymphatic system, explaining their interrelationships.
- Explain the functional and clinical importance of the lymphatic system.
- Differentiate between lymph and blood vessels.
- Enumerate the lymphoid organs and outline their interrelated functions.

Integumentary system

- Enumerate the parts of the integumentary system.
- Describe the components of skin.
- Differentiate between thick and thin skin.
- Discuss the functions of skin.
- Describe the function of the cells of the epidermis.
- Discuss about the epidermal appendages.
- Classify the types of hair with their distribution.
- Describe the parts, types, functions and life cycles of hair.
- Explain the factors responsible for the color of the skin & hair.
- Classify sweat glands with their distribution and explain function.

- Explain the function of different types of sebaceous glands with their distribution.
- Explain its clinical significance.
- Explain the functional nerve supply of skin glands.
- Describe the histology of skin.
- Explain the importance of dermis.
- Describe skin lines: surface pattern lines, tension lines, skin creases, wrinkle lines, flexure lines, papillary ridges, Langer's cleavage lines.
- Discuss the clinical and medicolegal importance of this lines.
- Compare dermal and epidermal repair.
- Summarise the age related changes in skin.
- Describe the development of different parts of skin and its appendages.
- Explain the anatomy of developmental and acquired disorder of the integumentary system

(Skill)

- Identify different structures relevant to the different body systems in different learning tools and explain the concepts depicted in illustrations related to Systemic Anatomy.
- Draw and label relevant aspects of Systemic Anatomy.
- Demonstrate the movements at different types of joint.
- Apply the specific anatomical principles lying behind specific anatomical concepts and information regarding different body systems in the learning and teaching of the anatomy.
- Demonstrate the different parts of nail apparatus.
- Demonstrate several of the following abilities (as instructed) in relation to Human Systemic Anatomy:
  - Prepare a lesson plan for a large group session (lecture) on a topic.
  - Prepare a lesson plan for a small group session (tutorial / practical) on a topic.
  - Prepare a handout for a large or small group session on a topic.
  - Prepare a good overlaying OHP transparency on a topic.
  - Prepare a good static/animated multimedia slide on a topic.
  - Prepare a model on a topic.
  - Run a small group session (tutorial / practical) on a topic.
  - Deliver a short talk on a topic on discussion.
  - Present a seminar on a topic.
  - Give a journal club presentation on a topic.
  - Construct proper SAQs, MCQs, SEQs essay questions and problem-based questions on different topics.
  - Conduct a simulated oral examination on a set of topics.
  - Construct OSPE stations (question / procedure station) on different topics.
  - Examine and mark answer scripts.
  - Use interactive CD-ROMs, on-line sources and other self-learning devices on different topics.

(Attitude)

- Utilise the knowledge, understanding and skills of Human systemic Anatomy through appropriate generalisation in understanding regional anatomy.

- Demonstrate the appropriate attitude towards learning and teaching of Human General Anatomy using updated understanding of the philosophy and techniques of Medical Education.

Course Content

- Relationships between regional anatomy and systemic anatomy.
- Functional and clinical correlation of anatomical concepts and information.
- The basic topographical and structural organisation of the human body.

- **Musculoskeletal system:**

○ **Cartilage**
  - Types and distribution
  - Function
  - Clinical correlation

○ **Bone**
  - Gross structure of bone
  - Form and architecture of bone
  - Periosteum
  - Classification of bone
  - Parts of a young (growing) long bone
  - Bone marrow
  - Ossification
  - Growth and remodelling
  - Function of bone
  - Blood supply of bone
  - Clinical correlation

○ **Joint**
  - Definition & parts of joint
  - Classification of joint
  - Fibrous joint
  - Cartilaginous joint
  - Synovial joint
  - Synovial bursa
  - Movement and mechanism of joints
  - Kinesiology
  - Blood supply of joint
  - Clinical correlation

○ **Muscle**
  - Classification of muscle (morphological & functional)
  - Skeletal muscle:
    Parts
    Origin and insertion

    Classification- anatomical
    Action
    Structure
    Organisation
    Growth and regeneration
    Vascular and lymphatic supply
    Tendon sheath

  - Smooth muscle:
    Arrangement & characteristics
    Mechanism of peristalsis
    Clinical correlation

  - Cardiac muscle:
    Arrangement & characteristics
    Clinical correlation

- **Cardiovascular system**
  - Circulation
  - Classification of blood vessels
  - Artery
  - Arteriole
  - Capillary
  - Sinusoid and venous sinus
  - Venule and vein
  - Anastomoses
  - Vasa vasorum
  - Clinical correlation
- **Lymphoreticular system**
  - Lymph
  - Mechanism of formation of lymph
  - Function of lymphoreticelar system
  - Components of lymphoreticular system
  - Lymph vessels
  - Basic structure of lymphoid tissue
  - Basic organisation of lymphatic drainage of different parts of the body
  - Clinical correlation
- **Integumentary system**
  - Types of skin
  - Histology of skin
  - Function of skin
  - Surface areas covered by skin in different body parts
  - Principle of blood supply and lymphatic drainage of skin
  - Principle of factors determining skin colour
  - Skin creases and dermatographics
  - Appendages of skin
  - Hair – parts, location, types, function, development, life cycle
  - Sebaceous gland
  - Sweat gland

- Nerve supply to glands of skin & appendages
- [redacted]

Educational Strategy

As outlined in section A-10 and as applicable

Learning Methods

As outlined in section A-10 and as applicable

Assessment

As outlined in section A-14 and as applicable

B:1.4 Cell Biology & Basic Molecular Biology

After completing this part of the Block, the residents should be able to:

(Knowledge)

- Define and differentiate between the common and important terms related to Cell Biology and Basic Molecular Biology.
- Describe the structural details of the different parts and components of a human somatic cell in general as well as of cells that have undergone various structural differentiation and explain those differentiation in terms of differential functions.
- Describe and explain the importance and steps of cell cycle and cell division (of different types) as well as the consequence of the common anomalies occurring in them.
- Describe the important cellular components and explain their distribution in the body in terms of functional significance.
- Describe the light and electron microscopic features (as applicable) of important cells and correlate the structural features with specific functions.
- Describe the important methods of the study of cells and explain why specific methods are used for specific purposes.
- Describe and explain DNA replication, coding and various stages of protein synthesis.
- Describe and explain the basic pathological changes occurring in cells and explain their implications.

(Skill)

- Identify and demonstrate different cells in sections under appropriate available microscope.
- Identify the light and electron microscopic features of important cells as well as the important cellular and histological events in different forms of figures (e.g. micrographs, realistic drawings, schematic drawings, flow charts).
- Draw and lebel the light and electron microscopic features of important cells as well as the important cellular events.
- Identify cell structure, function and phenomena in:
  i. Diagrammatic figures
  ii. Photomicrographs
  iii. Electron micrographs
  iv. Other images
- Draw & label:
  i. Diagrammatic figures
  ii. Photomicrographic features
  iii. Electron micrographic features
- Solve the problem arising during work in the lab
- Demonstrate several of the following abilities (as instructed) in relation to Cell Biology and Basic Molecular Biology:
  - Prepare a lesson plan for a large group session (lecture) on a topic.
  - Prepare a lesson plan for a small group session (tutorial / practical) on a topic.
  - Prepare a handout for a large or small group session on a topic.
  - Prepare a good overlaying OHP transparency on a topic.
  - Prepare a good static/animated multimedia slide on a topic.
  - Prepare a model on a topic.
  - Run a small group session (tutorial / practical) on a topic.
  - Deliver a short talk on a topic on discussion.
  - Present a seminar on a topic.
  - Give a journal club presentation on a topic.
  - Construct proper SAQs, MCQs, SEQs essay questions and problem-based questions on different topics.
  - Conduct a simulated oral examination on a set of topics.
  - Construct OSPE stations (question / procedure station) on different topics.
  - Examine and mark answer scripts.
  - Use interactive CD-ROMs, on-line sources and other self-learning devices on different topics.

(Attitude)

- Demonstrate the appropriate attitude towards learning and teaching of Cell Biology and Basic Molecular Biology using updated understanding of the philosophy and techniques of Medical Education.

Course content

- Cell membrane
- Movement of molecules across cell membrane
- Nucleus
- Cytoplasm (Organalles : membrane and non membrane bound)
- DNA
- RNA
- Protein synthesis
- Cell cycle
- Cell division
- Cell differentiation
- Cell renewal
- Cell hyperplasia
- Cell hypertrophy
- Cell degeneration
- Cell necrosis
- Programmed cell death

Educational Strategy

As outlined in section A-10 and as applicable

Learning Methods

As outlined in section A-10 and as applicable

Assessment

As outlined in section A-14 and as applicable

B:1.5 Postmortem Changes in the Human Body, Cadaver Preservation Techniques & Museum Techniques

Specific Objectives

After completing this part of the Block, the residents should be able to:

(Knowledge)

- Describe and identify the postmortem changes that occur in the human in varying time spans.
- Define preservation and outline the natural and artificial methods of cadaver preservation.
- Define and explain the terms, 'mummification, embalming' and 'modern embalming'.
- Describe the difficulties that may arise during cadaver preservation.
- Outline the characteristics of an ideal preservative.
- Mention the advantages and disadvantages of using formalin as a body preservative.
- Compare the relative amounts of different components of various types of embalming/ preserving fluids and outline their utilities.
- Demonstrate the understanding of the reasons for choosing specific arteries in the cadaver when using arterial embalming technique.
- Mention the difference of preservation technique of autopsied and unautopsied cadaver.
- Compare between postmortem lividity vs. bruise.
- Describe the process of arterial embalming.
- Mention the specific chemicals and other measures used to deal with some specific problems of body preservation.
- Explain the special measures taken to preserve specific types of body parts/organs.
- Outline the measures for prevention of catching disease from cadavers.
- Define plastination, explain its principle and name different types of plastination methods suitable for whole body, organs and body slice.
- Describe the common steps of human plastination.
- Outline the advantages of plastination over conventional embalming.
- Outline the principles of preparing and preserving anatomical museum specimens.
- Describe the process of donating body in Bangladesh.

(**Skill)**

- Identify the chemicals and equipments commonly used in cadaver embalming and plastination.
- Identify different types of postmortem changes on cadavers and in photograph.
- Embalm a dead body following appropriate procedure (depending on the availability during the course).
- Identify the principal features of different steps of plastination.
- Prepare and preserve anatomical museum preparation.

(**Attitude)**

- Show the appropriate attitude towards a cadaver while engaged in embalming, dissecting and demonstrating it.

Course content

- Post-mortem changes in the human body
- Preservation of dead body: definition; natural and artificial methods

- Ideal preservatives; characteristics and uses of different processing fluids (arterial fluid, tank fluid, cloth fluid)
- Embalming and modern embalming; procedures of embalming
- Special measures for dealing with specific problems in dead body preservation.
- Preservation of specific types of body parts and organs
- Plastination as a preservation technique
- Preparation and preservation of anatomical museum specimen
- Procedure of donating body in Bangladesh

Special placement

Places where practical exposure to preservation and preparation of human skeleton and dead body and techniques of dissecting & preserving specimens and viscera for museum are possible.

Educational Strategy

As outlined in section A-10 and as applicable

Learning Methods

As outlined in section A-10 and as applicable

Assessment

As outlined in section A-14 and as applicable

B:2 Phase- A Year- 1 Block- 2 (PAY1B2)

B:2.1 Basic and Medical Genetics

After completing this part of the Block, the residents should be able to:

(Knowledge)

- Define and differentiate between the common and important terms related to Genetics.
- Explain Mendel's laws with examples.
- Describe the structure of chromosome and DNA.
- Classify chromosome.

- Describe and explain the chromosomal behavior and distribution during interphase and during cell division (mitosis and meiosis).
- Describe and explain the structural anomalies of chromosome.
- Describe the numerical anomalies of chromosome and explain their development.
- Describe and explain DNA replication, gene coding and various stages of protein synthesis.
- Define gene, differentiate its types and explain their functions.
- Define and explain different types of gene mutation and their effects.
- Describe and explain the aetiology and characteristic features of different forms of genetic disorders (chromosomal, Mendelian, multifactorial and non- Mendelian).
- Demonstrate the ability to identify, explain and solve common clinical problems by the application of knowledge of Genetics in narrated and simulated cases.
- Describe and explain the variation on the effects of drugs due to genetic variation among indivialuals.
- Describe and explain the development and prevention of specific diseases as related to the genetic influences on the immune system.
- Describe and explain the development or prevention of cancer as related to genetic factors.
- Describe and explain the distribution and redistribution of genes in populations and their impacts.
- Describe and explain how the ecosystem is dependent on genetic factors.
- Describe and explain the processes of DNA cloning and its uses in medicine.
- Describe and explain cloning of organisms.
- Describe the steps of karyotyping. Relate genetic factors to developmental disorders.
- Describe the common methods used in recombinant DNA technology
- Explain with examples the basics of different methods of treating genetic disorders including gene therapy.
- Explain how phenomena like dominance, recessivity, mosaicism, homozygosity, heterozygosity, genetic heterogeneity, pleotropy, phenocopy, genomic imprinting, penetrate/expressivity, gene inactivation etc. influences the expression of diseases.

(Skill)

- Draw and/ or label in illustrations different structures & processes related to Genetics.
- Identify chromosomes & their anomalies, DNA replication, steps of protein synthesis and parts of genes in micrographs, drawings and other images.
- Identify the basic phenotypic features of common human genetic disorders in photographs, drawings and other images and in models and specimens.
- Describe and explain the characteristics of different patterns of inheritance.
- Identify the symbols of pedigree charts and explain the patterns of inheritance and possible genotypes in such charts.
- Determine the risks of different types of genetic disorder in individuals belonging to described scenarios of pedigree charts.
- Draw and label pedigree charts of supplied scenarios of genetic disorders
- Express the karyotype of a person from a given scenario
- Demonstrate proper history taking skill for genetic disorders on real or simulated cases.

- Identify the parts of different commonly used equipments in Genetics and explain their functions.
- Perform properly genetic counselling in simulated cases.
- Perform karyotyping.
- Perform DNA/ RNA electrophoresis.
- Perform DNA cloning using PCR technology.

- Demonstrate several of the following abilities (as instructed) in relation Basic and Medical Genetics:
    - Prepare a lesson plan for a large group session (lecture) on a topic.
    - Prepare a lesson plan for a small group session (tutorial / practical) on a topic.
    - Prepare a handout for a large or small group session on a topic.
    - Prepare a good overlaying OHP transparency on a topic.
    - Prepare a good static/animated multimedia slide on a topic.
    - Prepare a model on a topic.
    - Run a small group session (tutorial / practical) on a topic.
    - Deliver a short talk on a topic on discussion.
    - Present a seminar on a topic.
    - Give a journal club presentation on a topic.
    - Construct proper SAQs, MCQs, SEQs essay questions and problem-based questions on different topics.
    - Conduct a simulated oral examination on a set of topics.
    - Construct OSPE stations (question / procedure station) on different topics.
    - Examine and mark answer scripts.
    - Use interactive CD-ROMs, on-line sources and other self-learning devices on different topics.

(Attitude)

- Demonstrate the appropriate attitude towards learning and teaching of Genetics using updated understanding of the philosophy and techniques of Medical Education.

Course content

- The history of genetics
    - Mendel's laws:
        - law of uniformity
        - law of segregation
        - law of independent assortment
    - The Human Geneome Project
- The Cellular and molecular basis of inheritance
    - DNA
        - Composition
        - Structure
        - Replication
    - Types of DNA sequence
        - Nuclear genes
        - Extragenic DNA
        - Mitochondrial DNA
    - Transcription
        - RNA processing

    - Translation
        - Transfer RNA
        - Post-translational modifications
    - The genetic code
        - Triplet codons
    - Regulation of gene expression
        - Control of transcription
        - Transcription factors
        - Post-transcriptional control of gene expression
        - Alternate splicing
    - RNA-directed DNA synthesis
    - Mutations
        - Types – substitution, deletion, insertion
        - Structural effects of mutation on the protein
        - Mutations in non-coding DNA
        - Functional effects of mutation on the protein
        - Genotype-phenotype correlation
    - Mutagenesis
        - Mutagens
        - DNA repair

- Chromosome
    - Structure (in detail)– Watson- Crick model of DNA structure
    - Classification
    - Karyotyping
    - Chomosome nomenclature
    - Sex chromosome
    - Barr body & its utility
- Cell division
    - Mitosis
    - The cell cycle
    - Meiosis
- Chromatin: euchromatin vs heterochromatin
- Satellite bodies of chromosome – utility
- Numerical anomalies of chromosome
    - Aneuploidy- trisomy, monosomy etc.
    - Polyploidy
- Structural anomalies of chromosome:
    - Translocations
    - Deletion
    - Insertions
    - Duplication
    - Invertions
    - Ring chromosomes
    - Isochromosomes

- Mosaicism and chimerism
  - Mosaicism
  - Chimerism
- DNA technology and applications
  - DNA clonning
- Techniques of DNA analysis
  - Nucleic acid probes
  - Nucleic acid hybridization
  - Mutation detection
- Basics of developmental genetics
  - Epigenetics and development
    - X-chromosome inactivation
- Patterns of inheritance
  - Family studies
    - Pedigree drawing and terminology
  - Mendelian inheritance
    - Autosomal dominant inheritance
    - Autosomal recessive inheritance
    - Sex-linked inheritance
    - Establishing the mode of inheritance of a genetic disorder
  - Multiple alleles and complex traits
  - Anticipation
  - Mosaicism
  - Uniparental disomy
  - Genetic imprinting
  - Mitochondrial inheritance
- Hereditary disorders vs congenital anomalies- definition, types, examples, characteristics
- Genetic disorders-
  - Chromosomal disorders- definition, types, examples, characteristics
  - Single gene disorders- definition, types, examples, characteristics
  - Polygenic / multifactorial disorders- definition, types, examples, characteristics
  - Non-Mendelian forms of inheritance- definition, types, examples, characteristics
- Basics of Population Genetics
- Basics of Pharmacogenetics
- Basics of Immunogenetics
- Basics of Cancer Genetics
- Genetic counseling
- Basis of Ecogenetics

Special placement

Places where practical exposure to common laboratory procedures of Genetic and basic molecular biology are possible.

Educational Strategy

As outlined in Section A: 10 and as applicable

Learning Methods

As outlined in Section A: 10 and as applicable

Assessment

As outlined in Section A:14 and as applicable

B:2.2 General Developmental Anatomy (Prenatal and Postnatal Growth & Development, Neonatal Anatomy and Teratology)

Specific Objectives

After completing this part of the block the resident should be able to:

(Knowledge)

- Define and differentiate between the common and important terms related to General Developmental Anatomy.
- Explain the importance of General Developmental Anatomy in understanding human structure and function and its clinical significance.
- Outline the principal events in the history of Developmental Anatomy.
- Explain the basic aspects of the molecular regulation and signaling in the development of relevant structures.
- Distinguish between ontogeny and phylogeny and relate one with the other
- Describe and explain the importance and steps of cell division (of different types) as well as the consequences of the common anomalies occurring in them
- Explain the needs for mitosis and meiosis and the processes of such division.
- Describe and explain the important processes and phenomena like ovarian cycle, uterine cycle, oogenesis and spermatogenesis.

- Explain the chromosomal distribution and genetic exchange in meiosis.
- Describe and explain from sex determination to implantation, as well as the related anomalies.
- Describe and explain the basic principles and mechanisms of normal human development and growth and the relevant anomalies.
- Describe the basics aspects of the development of the body cavities.
- Describe and explain the formation, structure, functions and anomalies of the fetal membranes and placenta.
- Describe the types of placenta, placentation, and umbilical cord insertion.
- Explain the phylogenetical classification of placenta.
- Describe and explain different etiological factors, critical periods and the basics of prenatal diagnosis of teratogenesis.
- Describe the basics organogenesis, histogenesis, morphogenesis and postnatal development and growth of organs and parts of the human body and related anomalies
- Describe the basics of chemodifferentation & histodifferentiation.
- Demonstrate the ability to solve common clinical problems by the application of knowledge of Embryology and Genetics in narrated and simulated cases.
- Describe the process factors involved and their role in sex differentiation .
- Mention the ways of investigating into the anomalies and identify the normal findings in conventional radiographs and USG scans.
- Define “stem cells” & explain their utility in treating disorders.

(Skill)

- Prepare and stain serial sections of different periods of chick embryo.
- Draw and label cross sections of different periods of chick embryo.
- Identify of different parts of chick embryo sections of different periods under conventional light microscope.
- Identify normal human developmental processes and structures as well as their anomalies (from gametogenesis to postnatal growth and development) in photographs, micrographs, drawings and other images and in models and specimens (including whole human specimens)
- Draw and label different types of figure related to Embryology covering developmental mechanisms, development of particular organs and parts as well as developmental anomalies (from gametogenesis to postnatal growth and development).
- Draw, label and identify different structures, processes, stages and phenomena related to Embryology & Genetics in figures, models, specimens and under microscope (human and of other species).
- Identify different parts of the human placenta and umbilical cord (correlated with functions).
- Identify placental and umbilical cord variations and anomalies in specimens, drawings and models (correlated with aetiological and functional aspects.
- Identify the important and common similarities of humans with other species in drawings, photographs or micrographs.

- Draw and label different types of figure related to General Developmental Anatomy covering developmental mechanisms, development of particular organs and parts as well as developmental anomalies (from gametogenesis to postnatal growth and development).
- Perform the normal vaginal delivery (cephalic presentation) in a model.
- Demonstrate several of the following abilities (as instructed) in relation to General Developmental Anatomy:
  - Prepare a lesson plan for a large group session (lecture) on a topic.
  - Prepare a lesson plan for a small group session (tutorial / practical) on a topic.
  - Prepare a handout for a large or small group session on a topic.
  - Prepare a good overlaying OHP transparency on a topic.
  - Prepare a good static/animated multimedia slide on a topic.
  - Prepare a model on a topic.
  - Run a small group session (tutorial / practical) on a topic.
  - Deliver a short talk on a topic on discussion.
  - Present a seminar on a topic.
  - Give a journal club presentation on a topic.
  - Construct proper SAQs, MCQs, SEQs essay questions and problem-based questions on different topics.
  - Conduct a simulated oral examination on a set of topics.
  - Construct OSPE stations (question / procedure station) on different topics.
  - Examine and mark answer scripts.
  - Use interactive CD-ROMs, on-line sources and other self-learning devices on different topics.

(Attitude)

- Demonstrate the appropriate attitude towards learning and teaching of General developmental Anatomy using updated understanding of the philosophy and techniques of Medical Education.

  *The topics related to the reproduction will be covered in Anatomy of Reproduction.

Course Content

- Introductory topics:
  - Terminology related to Developmental Anatomy
  - Significance of Developmental Anatomy, including its clinical relevance
  - Historical perspectives
  - Introduction to molecular regulation & signaling
- Ontogeny and phylogeny
- Mitosis, meiosis & gametogenesis:
  - Primordial germ cells
  - Needs processes of mitotic & meiotic divisions
  - Meiotic cell division & chromosomal distribution in it
  - Testicular structure and spermatogenesis
  - Ovarian cycle, uterine cycle, ovarian structure, oogenesis and ovulation

- Oocyte and sperm transport and preparations for fertilization (including capacitation and acrosome reaction)
- Clinical correlation

- Fertilization and pre-embryonic period or germinal period (first & second weeks):
  - Fertilization, first week of development , cleavage, blastocyst formation & implantation.
  - Second week of development (bilaminar germ disc)
  - Clinical correlation of the above topics
- Embryonic period (third to eight weeks):
  - Gastrulation: Formation of embryonic mesodesm & endoderm
  - Formation of the notochord
  - Generation of the embryonic body plan: Specification of the body axes, establishment of fate map segmentation and side determination, cephalocaudal and lateral folding
  - Growth and differentiation: Cell & tissue differentiation, different mechanisms of growth and development including differential growth, cell death, cell-cell interaction (including induction), cell migration, organ migration, rotation fusion potency & plasticity
  - Further development of the trophoblast
  - Derivatives of the ectodermal, mesodermal & endodermal germ layers
  - Sexual differentiation: Chromosomal sex, gonadal sex, phenotypic sex
  - Other changes in the second month
  - Estimation of embryonic age
  - Clinical correlation of the above topics
- Foetal period (Third month to birth):
  - Chorion and chorionic cavity
  - Amnion and amniotic cavity
  - Umbilical cord and yolk sac
  - Decidua, placenta and placentation
  - Stages of foetal development & characteristics of foetal growth
  - Estimation of foetal age
  - Clinical correlation of the above topics
- Basics of pregnancy & parturition, multiple pregnancy and related anomalies
- Basic aspects of the development of the body cavities.
- Types of placenta, placentation, and umbilical cord insertion.
- Neonatal anatomy: Principal features different from the adult
- General teratology:
  - Principles of teratology
  - Factors, effects, detection and remedies in relation to birth defects
- Postnatal growth & development:
  - Explanations of frequently used developmental terms: Infancy and childhood adolescence and adulthood

Special placement

Places where practical exposure to Neonatology and Teratolotgy is possible.

Educational Strategy

As outlined in section A-10 and as applicable

Learning Methods

As outlined in section A-10 and as applicable

Assessment

As outlined in section A-14 and as applicable

B:2.3 Anatomy of Reproduction

Specific objectives

After completing this part of the Block, the residents should be able to:

(Knowledge)

- Define sexual maturity and explain the process of attaining sexual maturity in males and females.
- Define puberty.
- Describe and explain the significance of the physical characteristics of puberty.
- Describe and explain the process of erection, copulation and ejaculation.
- Mention the factors important for normal fertility in males and females.
- Define infertility and enumerate its types.
- Explain the cause of infertility in males and females.
- Name the different methods of assisted reproduction.
- Outline the implications of different methods of assisted reproduction and explain the positive outcomes and complications related to them.
- Explain common clinical disorder related to reproduction.

(**Skill)**

- Perform semen analysis & interpreates the findings

- Identify a good quality egg (oocyte) under microscope and illustrations.
- Demonstrate several of the following abilities (as instructed) in relation to Anatomy of Reproduction:
  - Prepare a lesson plan for a large group session (lecture) on a topic.
  - Prepare a lesson plan for a small group session (tutorial / practical) on a topic.
  - Prepare a handout for a large or small group session on a topic.
  - Prepare a good overlaying OHP transparency on a topic.
  - Prepare a good static/animated multimedia slide on a topic.
  - Prepare a model on a topic.
  - Run a small group session (tutorial / practical) on a topic.
  - Deliver a short talk on a topic on discussion.
  - Present a seminar on a topic.
  - Give a journal club presentation on a topic.
  - Construct proper SAQs, MCQs, SEQs essay questions and problem-based questions on different topics.
  - Conduct a simulated oral examination on a set of topics.
  - Construct OSPE stations (question / procedure station) on different topics.
  - Examine and mark answer scripts.
  - Use interactive CD-ROMs, on-line sources and other self-learning devices on different topics.

(**Attitude)**

- Demonstrate compassion while dealing with person during semen analysis and/ or associated procedures.
- Demonstrate the appropriate attitude towards learning and teaching of Anatomy of Reproduction using updated understanding of the philosophy and techniques of Medical Education.

Course Content

- Functional anatomy of male and female organs of reproduction
- Sexual maturity and puberty
- Anatomy of libido, erection, copulation & orgasm in male & female, ejaculation
- Basics of fertility & infertility
  - Factors important for normal fertility in males & females
  - Semen analysis
  - Definition & types of infertility
  - Causes of infertility in males & females
- Assisted reproduction
  - Principles of assisted reproduction
  - Indications, methods and contraindication and outcomes of assisted reproduction.
- Other common clinical correlation

Special placement

Places where practical exposure to Anatomy of reproduction (Specially artificial reproduction) is possible.

Educational Strategy

As outlined in section A-10 and as applicable

Learning Methods

As outlined in section A-10 and as applicable

Assessment

As outlined in section A-14 and as applicable

B:2.4 Basics of Forensic Anatomy & Physical Anthropology

Specific objective

After completing this part of the Block, the residents should be able to:

(Knowledge)

- Define Physical Anthropology, Forensic Anatomy and Anthropometry.
- Explain the importance of Physical Anthropology, Forensic Anatomy and Anthropometry.
- Define some important anthropometric measurements of the body.

(**Skill)**

- Identify some important landmarks of the body used for measurement s in anthropometry.
- Determine the sex and age of an individual from surface anatomical and bony features.

(**Attitude)**

- Demonstrate the appreciation of individual diversity of human physical features in the context of striking similarity between the so-called human races.
- Demonstrate the appropriate attitude towards learning and teaching of Basic of Forensic Anatomy & Physical Anthropology using updated understanding of the philosophy and techniques of Medical Education.

Course Content

- Basics of Physical Anthropology and Forensic Anatomy
- Anthropometry and its importance
- Some important body landmarks used in anthropometry

- Some important anthropometric measurements of the body
- Determination of age and sex using surface anatomical & bony features
- The idea of human race in anatomical science and related misconceptions

Educational Strategy

- As outlined in section A-10 and as applicable

Learning Methods

- As outlined in section A-10 and as applicable

Assessment

- As outlined in section A-14 and as applicable

B:2.5 General Aspects of Medical Education

Specific objectives

The 'Medical Education' part of this block is divided into 15 sections. The following is a detailed section-wise distribution of its learning objectives.

After completing Section- 1 (Introduction to Medical Education), the residents should be able to:

(Knowledge)

- Identify different aspects of Medical Education.
- Define and differentiate between important terms in the terminology of Medical Education.
- Explain the importance of Medical Education as a field of Science.
- Explain the specific importance of a course on Medical Education for the Masters students of Basic Medical Sciences of BSMMU.

(**Attitude)**

- Demonstrate an interest in modern and ever-evolving aspects of Medical Education.
- Demonstrate an eagerness to evolve according to the demands of the progress in Medical Education.

After completing Section- 2 (Curriculum), the residents will be able to:

(Knowledge)

- Define 'curriculum'.
- Differentiate between 'curriculum' and 'syllabus'.
- Explain the utilities and importance of curriculum.
- Define and describe different components of curriculum, citing appropriate examples.
- Define different terms regarding curriculum (including core and optional curriculum; evidence-based curriculum; outcome-based curriculum; informal, hidden and null curriculum), citing appropriate examples.
- Name the stakeholders of curriculum and indicate their interrelationships.
- Describe the stages of curriculum development.

(Skill)

- Discuss how a curriculum should be communicated and managed (implemented).
- Discuss how a curriculum and a course should be evaluated.
- Demonstrate the ability to design a curriculum by designing a specific part of it for their own disciplines.

(**Attitude)**

- Demonstrate the eagerness to study the curricula of renowned course and to bring about appropriate necessary changes in the relevant curriculum of her/his own discipline.
- Demonstrate the willingness of being evaluated.

After completing Section- 3 (Effective Learning), the residents should be able to:

(Knowledge)

- Define 'learning'.
- Differentiate between 'learning' and 'teaching'.
- Outline the basis of learning in humans.
- Explain the characteristics of adult learning.
- Describe different types and levels of learning, citing appropriate examples.
- Explain 'effective learning'.

(Attitude)

- Demonstrate the characteristics of a deep learner an attitude of becoming a deep learner and life-long learner.

After completing Section- 4 (Educational/Learning Objectives), the residents should be able to:

(Knowledge)

- Define 'educational objectives', citing appropriate examples.
- Explain (with appropriate examples) the 'taxonomy of educational objectives' addressing:
  - Different 'domains' of educational objectives- cognitive (knowledge), psychomotor (skill) and affective (attitude).
  - Different 'levels' of cognitive domain.
- Distinguish between 'learning objectives' and 'learning out comes'.
- Define 'learning strategies'.
- Differentiate between the traditional and the modern learning strategies (like the SPICES model) and outline the ways of adopting the modern strategies.

(Skill)

- Formulate (write down) the objectives outcomes of the undergraduate and postgraduate courses of Anatomy.
- A large group (lecture) session designed for Anatomy.
- A small group tutorial session for Anatomy.
- A small group practical session for Anatomy.

(Attitude)

- Demonstrate an attitude of designing curriculum learning sessions based on specific educational (learning) objectives/outcomes.
- Demonstrate an attitude of specific aspects of learning relating to specific domains of educational objectives.

After completing Section- 5 (Communication), the residents should be able to:

(Knowledge)

- Define 'communication'.
- Identify the elements of communication.
- Explain the basis of effective communication.
- Outline the characteristics of 'effective teaching'.

(Skill)

- Demonstrate the ability to explain a short topic to a fellow resident in a role-play exercise

(Attitude)

- Demonstrate an attitude of internalising the importance communicative skills (in addition to knowledge) on the part of the learning facilitator (teacher) in ensuring effective learning.

After completing Section- 6 (Lesson Plan) and Section- 7 (Large Group Session), the residents should be able to:

(Knowledge)

- Define 'lesson plan'.
- Explain the utilities of a lesson plan.
- Define different components of a lesson plan.
- Indicate the interrelationships between the different components of a lesson plan.
- Outline the stages of preparing a lesson plan.
- Define 'large group session'.
- Outline the characteristics of a large group session.
- Explain the utilities and advantages of large group sessions.
- Explain the limitations and disadvantages of large group sessions.
- Describe the components of a large group session, citing appropriate examples.
- Mention the features to be maintained and the features to be avoided in a large group session.
- Outline the ways of improving the effectiveness of a large group session.

(Skill)

- Prepare a lesson plan for a large group session for the undergraduate / postgraduate students oo Anatomy.

(Attitude)

- Demonstrate an attitude of valuing the relative advantages and limitations of large group learning sessions compared to other methods in selecting large group session for specific learning activities.

After completing Section- 8 (Small Group Session), the residents should be able to:

(Knowledge)

- Define 'small group session'.
- Outline the characteristics of a small group session.
- Explain the utilities and advantages of small group sessions.
- Explain the limitations and disadvantage of small group sessions.
- Define different methods that may be used in a small group session.

(Skill)

- Prepare a lesson plan for a small group tutorial session using an important small group method like:
  - Brain-storming
  - Snow-balling
  - Role-playing
- Prepare a lesson plan a for a small group practical session using an appropriate small group method.

(Attitude)

- Demonstrate an attitude of valuing the relative advantages and limitations of different small group methods of learning and these compared to other methods in selecting a specific method for specific learning activities.

After completing Section- 9 (Self-Learning), the residents should be able to:

(Knowledge)

- Define 'self-learning'.
- Explain the importance of self-learning.
- Describe the ways in which self-learning may be achieved.
- Distinguish between 'self-learning' and 'self-directed learning' and explain the importance of 'self-directed learning'.

(Skill)

- Demonstrate the ability to use learning tools like digital tools.

(Attitude)

- Demonstrate the characteristics of a self-directed learner.

After completing Section- 10 (Appropriate Designing, Preparation and Use of Instructional Material and Appropriate Use of Equipment of Instruction), the residents should be able to:

(Knowledge)

- Classify instructional materials, citing appropriate examples of each type.
- Explain the relative advantages and disadvantages of using different instructional materials in dealing with:
  - Varying topics
  - Varying situations
  - Varying types of session

- Outline the basic principles of design.
- Demonstrate an understanding of the attributes of a good design.
- Identify the strengths and weaknesses of a common instructional material (e.g., an OHP transparency, a multimedia slide or a handout in terms of content, design and presentation (e.g., animation).
- Outline the points to remember during the use of common equipment like OHP and multimedia projector.
- Outline the attributes of a good oral presentation.

(Skill)

- Create an OHP transparency that possesses the attributes of a good transparency.
- Create a multimedia slide that possesses the attributes of a good slide.
- Create a handout that possesses the attributes of a good handout.
- Use an OHP and a multimedia projector properly.
- Demonstrate the ability to deliver a good oral presentation.

(Attitude)

- Demonstrate the attitude of creating good instructional material and using instructional equipment properly the aptitude of delivering a good oral presentation.

After completing Section- 11 (Basics of Assessment of Students), the residents should be able to:

(Knowledge)

- Define 'assessment' (of students).
- Demonstrate an understanding of what to be assessed, when to be assessed and how to be assessed.
- Outline the functions of assessment, including its role in learning.
- Explain the principles of good assessment (including validity, reliability, objectivity, practicality / feasibility and effectiveness), citing appropriate examples.
- Distinguish between different types of assessment (including formative / summative, norm-referenced / criterion-referenced assessment).
- Define 'assessment instrument'.
- Enumerate different types of assessment instrument.
- Identify the cognitive domain(s) addressed in a question.
- Identify the strengths and weaknesses of a theoretical question in terms of its validity, reliability, objectivity, practicality and effectiveness for a particular aspect or situation of assessment.

- Identify the strengths and weaknesses of a practical station in terms of its validity, reliability, objectivity, practicality and effectiveness for a particular aspect or situation of assessment.;
- Outline the basics of Computer Assisted Testing (CAT).
- Identify the practical problems in using different assessment instruments and indicate plausible solutions.
- Outline the validation system of assessment instruments.

(Skill)

- Demonstrate the ability to prepare a 'test matrix'.

(Attitude)

- Demonstrate the attitude of regarding assessment as a tool to help learners through appropriate and adequate feedback.
- Demonstrate the willingness to make an assessment instrument valid, reliable, practicable and objective.

After completing Section-12 (Essay Question), the residents should be able to:

(Knowledge)

- Define 'essay question'.
- Explain the utilities and advantages of essay questions.
- Identify the aspects and situations of assessment in their own disciplines where essay questions may prove better instruments than other types of question.
- Discuss the limitations and disadvantages of essay questions.
- Outline the ways of improving essay questions.
- Identify the strengths and weaknesses of particular essay questions.
- Outline the attributes of a good written question paper (including weight distribution for different topics and different cognitive domains).

(Skill)

- Construct good essay questions on relevant topics of Anatomy using updated understanding of Medical Education.

(Attitude)

- Demonstrate the determination of being unbiased in constructing / selecting essay questions appropriate for assessing specific aspects of learning.

After completing Section- 13 (MCQ / SAQ / SEQ), the residents should be able to:

(Knowledge)

- Define 'Multiple Choice Question (MCQ)', 'Short Answer Question (SAQ)' and 'Structured Essay Question (SEQ)', outlining the characteristics and citing appropriate examples of each.
- Explain the specific utilities and advantages of MCQ, SAQ, and SEQ.
- Explain the specific limitations of MCQ, SAQ and SEQ.
- Explain the characteristics, strengths and weaknesses of different types of MCQ, citing appropriate examples.
- Explain the characteristics, strengths and weaknesses of different types of SAQ, citing appropriate examples.
- Identify the strengths and weaknesses of given MCQs, SAQs and SEQs.

(**Skill)**

- Construct good MCQs of different types on relevant topics of Anatomy.
- Construct good SAQs of different types on relevant topics of Anatomy.
- Construct good SEQs on relevant topics of Anatomy.

(Attitude)

- Demonstrate the willingness to appreciate the strengths and weaknesses of different types of MCQ, SAQ and SEQ in ensuring their differential use in written assessment.

After completing Section- 14 (Oral Examination), the residents should be able to:

(Knowledge)

- Explain the utility of (i.e., what can and what cannot be assessed through) oral examinations.
- Indicate the limitations and disadvantages of traditional oral examinations.
- Explain the usefulness and limitations of 'structuring'.
- Define 'Structured Oral Examinations (SOE)'.
- Outline the characteristics of SOE.
- Outline the advantages of SOE over traditional oral examinations.
- Outline the limitations of SOE.
- Demonstrate an understanding of 'semi-structured' oral exams.

(Skill)

- Prepare good instruments (questions) for SOE or semi-structured oral exam on relevant topics of Anatomy.

(Attitude)

- Demonstrate the willingness to make oral examination more friendly, structured and objective, yet meaningful.

After completing Section 15 (Practical Examination), the residents should be able to:

(Knowledge)

- Demonstrate on understanding of what is to be assessed in a practical examination in contrast to oral examination.
- Define 'Objective Structured Practical Examination (OSPE)' and 'Objective Structured Clinical Examination (OSCE)'.
- Outline the characteristics of OSPE.
- Demonstrate the understanding of the steps of organising an OSPE.

(Skill)

- Prepare a good OSPE question station (with an appropriate checklist) for Anatomy.
- Prepare a good OSPE procedure station (with an appropriate checklist) for Anatomy.

(**Attitude)**

- Demonstrate aptitude of making proper distinction between assessment of theoretical knowledge and that of practical skills.
- Demonstrate the willingness to make OSPE stations reliable and objective.

Course content

Introduction to medical education
Curriculum
Teaching-learning

- Effective learning
- Learning strategies
- Learning objectives
- Communication
- Lesson plan
- Large group teaching
- Small group teaching
- Self-learning

Instructional material design

- Appropriate designing, (planning) preparation and use of instructional material
- Appropriate use of equipments of instruction
- Attributes of a good oral presentation

Assessment of residents / students

- Basics of assessment of students
- Assessment of theoretical knowledge:
  - Multiple Choice Question (MCQ)
  - Short Answer Question (SAQ)
  - Structured Essay Question (SEQ)
  - Essay Question (EQ)
- Oral examination
- Practical examination

Special placement

- Places where practical exposure to teaching and assessment of undergraduate /postgraduate students in a medical institution is possible.

Educational Strategy

- The 'Medical Education' part of this Block is based on seven interactive lectures and three discussion sessions by medical educationists and experienced teachers of the University and from outside.
- It begins with a short introductory and motivating presentation preceded by a pre-test.
- The lectures use multimedia presentation, white board, OHP, flip chart etc., cite adequate examples and make demonstrations proper use of instructional materials and instructional equipment.
- One special session from a guest lecturer is arranged to generate interest among the residents in extra-curricular reading and/or audio-visual material and events to make them 'more complete' facilitators of learning.
- This part of the Block ends with a motivational lecture by an accomplished and experienced teacher. A post-test is used to evaluate the affectivity of this exposure.
- Additional discussion sessions are arranged it the residents request so.

Assessment of residents

- Random questions are asked during the lectures and discussion sessions to assess the progress of the residents.
- One or more assignment is given to each resident on the topic(s) of every lecture session. These are assessed and graded by the respective lectures and written feedback is provided the assignees.
- A written assessment is carried out at the end of this part using objective questions (single statement T/F question/fill-in-the gap type question/MCQ).
- The grading of the assignment together with that of the written assignment is use to determines whether the performance of a resident is satisfactory.

Phase- A Year- 1 Block- 3 (PAY1B3)

B:3.1 General Histology

Specific objectives

After completing this part of the Block, the residents should be able to:

(Knowledge)

- Define the common and important terms related to General Histology.
- Describe the important methods of the study of tissues, from fixation to staining, and explain why specific methods are used for specific purposes.
- Describe and explain the mechanisms of different important forms of microscopy
- Classify tissues outlining the specific characteristics of different types and citing examples of each .
- Define and classify glands outlining the specific characteristics of different types and citing examples of each.
- Describe the important tissue components (e.g., cells, fibres and ground substances) and explain their distribution in the body in terms of functional significance.
- Describe the light and electron microscopic features (as applicable) of slected tissues and tissue components and correlate the structural features with specific functions.
- Name the important materials used for common histologic techniques and explain their specific importance .
- Describe and explain the basic pathological changes occurring in cells and tissues and explain their implications.

(Skill)

- Set a binocular conventional light microscope and focus histological slides at different magnifications.
- Identify and demonstrate the use of available equipment and materials in histological tissue preparation, sectioning, staining and mounting and deal with the common problems arising during these procedures.
- Perform tissue preparation, sectioning, staining and mounting for routine microscopy (as well as for some important special staining) and explain the significance of various steps.
- Demonstrate the use of important forms of microscopes available in the department.
- Draw, label and identify the different parts of an ordinary light microscope, explain its mechanism of image formation and demonstrate the use of its different parts.

- Identify and demonstrate different cells, cell components and tissues in sections under appropriate available microscopes.
- Perform microscopic measurement of tissue components under microscopes using manual micrometry and computer software.
- Identify the light and electron microscopic features of important cells, cell components, and tissues as well as the important cellular and histological events in different forms of figures (eg, micrographs, realistic drawings, schematic drawings, flow charts) and models.
- Draw and label the light and electron microscopic features of important cells, cell components, and tissues as well as the important cellular and histological events.
- Solve problems arising during work in the lab
- Solve other problems related to General Histology.
- Demonstrate several of the following abilities (as instructed) in relation to General Histology:
  - Prepare a lesson plan for a large group session (lecture) on a topic.
  - Prepare a lesson plan for a small group session (tutorial / practical) on a topic.
  - Prepare a handout for a large or small group session on a topic.
  - Prepare a good overlaying OHP transparency on a topic.
  - Prepare a good static/animated multimedia slide on a topic.
  - Prepare a model on a topic.
  - Run a small group session (tutorial / practical) on a topic.
  - Deliver a short talk on a topic on discussion.
  - Present a seminar on a topic.
  - Give a journal club presentation on a topic.
  - Construct proper SAQs, MCQs, SEQs essay questions and problem-based questions on different topics.
  - Conduct a simulated oral examination on a set of topics.
  - Construct OSPE stations (question / procedure station) on different topics.
  - Examine and mark answer scripts.
  - Use interactive CD-ROMs, on-line sources and other self-learning devices on different topics.

(Attitude)

- Behave sensibly in using laboratory equipment and materials in terms of appropriate use of manual, economical use of materials as well as carefulness and cleanliness.
- Put the equipment and materials in their proper locations after use.
- Take proper safety measures for oneself and for the group as a whole while working in labs/dissection hall.
- Demonstrate proper attitude for learning and teaching of General Histology using updated understanding of the philosophy and techniques of Medical Education.

Course content

Histological techniques

Overview of methods used in histology

Tissue preparation

- Fixation and fixatives
- Dehydration
- Clearing
- Embedding
- Usual sectioning & cryosection
- Staining: different principles and applied aspects.
- Hematoxylin and eosin staining
- Other important staining procedures

Histochemistry and cytochemistry

- Chemical composition of histologic samples
- Chemical basis of staining
- Enzyme digestion
- Enzyme histochemistry
- Immunocytochemistry
- Hybridization techniques
- Autoradiography

Microscopy

- Basic optics relevant to microscopy
- Conventional light microscopy and other optical systems:
  Polarising microscopy, phase-contrast microscopy, fluorescent microscopy
- Electron microscopy
- Atomic force microscopy
- Micrometry
- Camera lucida drawing under light microscope
- Counting of tissue components using light microscope

Basic tissues

Epithelial tissue

Overview of epithelial structure and functions

Classification of epithelium

Cell polarity

The apical domain and its modifications

- Microvilli
- Stereocilia

- Cilia

The lateral domain and its specializations in cell-to-cell adhesion

- Occluding junctions
- Anchoring junctions
- Communicating junctions
- Morphologic specialisations of the lateral cell surface

The basal domain and its specializations in cell-to– extracellular matrix adhesion

- Basement membrane structure and function
- Cell-to–extracellular matrix junctions
- Morphologic modifications of the basal cell surface

Glands

Epithelial cell renewal

Connective tissue

- General structure and function of connective tissue
- Embryonic connective tissue
- Connective tissue proper
- Connective tissue fibers
- Collagen fibres and fibrils
- Biosynthesis and degradation of
  Collagen fibres
  Reticular fibres
  Elastic fibres

Extracellular matrix

Connective tissue cells

- Fibroblasts and myofibroblasts
- Macrophages
- Mast Cells
- Basophils
- Adipocytes
- Adult stem cells and pericytes
- Lymphocytes, plasma cells, and other cells of the immune system

Cartilage

- Overview of cartilage

- Hyaline cartilage
- Elastic cartilage
- Fibrocartilage
- Chondrogenesis and cartilage growth
- Repair of hyaline cartilage

Bone

- Overview of bone
- Bones and bone tissue
- General structure of bones
- Outer surface of bones
- Bone cavities
- Mature bone
- Immature bone

Cells of bone tissue

- Osteoprogenitor cells
- Osteoblasts
- Osteocytes
- Bone-Lining cells
- Osteoclasts

Bone formation

- Intramembranous ossification
- Endochondral ossification
- Growth of endochondral bone
- Development of the osteonal (haversiansystem)
- Biologic mineralization and matrix vesicles

Joints types and examples

- Synovial fluid
- Synovial membrane
- Inter vertebral disk
- Synoviocytes

Adipose tissue

Overview of adipose tissue
White adipose tissue
Function of white adipose tissue

- Differentiation of adipocytes
- Structure of adipocytes and adipose tissue
- Regulation of adipose tissue

Brown adipose tissue

Muscle tissue

Overview and classification of muscle

Skeletal muscle

- Myofibrils and myofilaments
- The contraction cycle
- Motor innervation
- Sensory innervation
- Development, repair, healing, and renewal

Cardiac muscle

- Structure of cardiac muscle
- Injury and repair

Smooth muscle

- Structure of smooth muscle
- Functional aspects of smooth muscle
- Renewal, repair, and differentiation

Cardiovascular system

Overview of the cardiovascular system

General features of arteries and veins

- Layers of vascular wall
- Vascular endothelium

Arteries

Large arteries (elastic arteries)

- Medium arteries (muscular arteries)
- Small arteries and arterioles

Capillaries

- Classification of capillaries
- Functional aspects of capillaries

Veins

- Arteriovenous shunts
- Venules and small veins
- Medium veins
- Large veins

Atypical blood vessels

Lymphatic vessels

Special placement

Places where practical exposure to procedure of special types of tissue processing, sectioning and microscopy:

- Cryosection
- Phase contrast microscopy
- Fluorescent microscopy
- Confocal microscopy
- Electron microscopy
- Others

Educational Strategy

As outlined in section A-10 and as applicable

Learning Methods

As outlined in section A-10 and as applicable

Assessment

As outlined in section A-14 and as applicable

B:3.2 Human Abdomen, Pelvis & Perieum

Specific objectives

After completing this part of the Block, the residents should be able to do the following in relation related to Human Abdomen, Pelvis and Perineum:

(Knowledge)

- Define and differentiate between the important and common anatomical terms related to the region (including abdomen; true pelvis, false pelvis and perineum)
- Describe different anatomical structures of the region in terms of location, extent, parts, anatomical position, gross features and relations.

- Explain the principle (mode) of arterial supply and general plans of venous drainage and lymphatic drainage of the region (in terms of developmental origin if applicable).
- Describe the arterial supplies, venous drainages, lymphatic drainages as well as the sendory, somatomoter and secrectomoter nerve supplies of the individual organs and parts of the region (however, the details of the individual nerves and nerve plexuses are covered in Human Neuroanatomy of Block-4).
- Describe the origins, divisions, courses, branches, areas of supply and effects of blockage/ severing of the important arteries of the region, and explain them using anatomical logic.
- Describe the formations, terminations, tributeries, areas of drainage and effects of blockage/ severing of the important veins of the region, and explain them using anatomical logic.
- Describe the collateral circulations that may develop to compensate the blockage/ severing of the important vessels of the region and explain them using anatomical logic.
- Describe the origins, insertions, actions, participation in movements, relations etc. (as applicable) of important individual and groups of muscles of the region and explain them using anatomical logic.
- Mention the locations of the important ossification centres in the bones of the region and outline their times of appearance and fusion with the shaft/body.
- Describe the various parts of the skeleton and bones of the region along with the important attachments and relations.
- Describe and explain the types, formations, functions structural features, and nerve supply of the joints of the region as well as the movements occurring at tem and the muscles and nerves responsible.
- Describe and explain the anatomy of the common physiological processes (including pregnancy, parturition and everyday activities) drawing functional correlations with the anatomical structures relevant to the region.
- Describe and explain the anatomical aspects of the common clinical procedures relevant to the region.
- Describe and explain the anatomical aspects of the common acquired disorders relevant to the region.
- Describe the normal development of different organs/parts of the region and the common and important developmental anomalies and explain the mechanisms involved in the normal and abnormal development.
- Explain the blood supply, nerve supply and lymphatic drainage of different organs / parts of the region from developmental black grounds.
- Describe and explain, structural and ultrastructural organizations and features (as applicable) of the important cells, tissue components, tissues and organs of the region, and correlate the structural features with specific functions.
- Describe the locations, extent, parts and openings of the salivary glands.
- Describe and explain the planes and axes of the movements occurring at different joints of the region and correlate the movements with everyday activities.

(Skill)

- Identify different anatomical parts organs and structures of the region in cadavers /viscera /skeletons/bones /models/illustrations (including sectional views)/living bodies.

- Demonstrate the understanding of the relative orientation of different structures in various parts of this region by using models/skeletons/illustrations/living bodies/cadavers.
- Demonstrate the understanding of the functional locations and orientations of individual bones of the region in the skeleton, thus emphasising the skeleton as a functional whole rather than a mere collection of bones.
- Perform dissection on cadavers/viscera to reveal and identify important anatomical structures/parts/organs of the region.
- Draw and label important anatomical structures (including sectional views)/processes/phenomena of the region.
- Identify structural /ultrastructural features of important cells, tissue components, tissues and organs as well as the important cellular and histological events in different forms of illustrations photomicrographs, electron (micrographs, realistic drawings, schematic drawings, flow charts of others) and in models.
- Outline the surface projections of important structures organs of the region on the body surface.
- Palpate different bony, muscular and other prominences of the region on the living body.
- Identify the normal structures/organs/parts of the region in diagnostic images and explain the implications of images in the common and important developmental and acquired disorders.
- Demonstrate an understanding of the locations, orientations and participation of various anatomical structures in different common and important physiological activities of the region using living bodies models / illustrations.
- Demonstrate the ability to solve common clinical problems in narrated and simulated cases by the application of the anatomical knowledge of to this region.
- Identify different developmental stages, phenomena and mechanisms of the different organs/parts of the region in different forms of illustrations, models and specimens.
- Identify common and important developmental anomalies of the region illustrations, models and specimens.
- Identify common and important acquired clinical disorders of the region (that have anatomical implications) in illustrations, models and specimens.
- Prepare histological slides important structures / organs of the region with routine /special stains (as instructed).
- Demonstrate several of the following abilities (as instructed) in relation to Human Abdomen, Pelvis and Perineum:
- Demonstrate the movements occurring at different joints of the region showing the corresponding planes and axes.

- Demonstrate several of the following abilities (as instructed) in relation to Human abdomen, Pelvis & Perineum:
  - Prepare a lesson plan for a large group session (lecture) on a topic.
  - Prepare a lesson plan for a small group session (tutorial / practical) on a topic.
  - Prepare a handout for a large or small group session on a topic.
  - Prepare a good overlaying OHP transparency on a topic.
  - Prepare a good static/animated multimedia slide on a topic.
  - Prepare a model on a topic.
  - Run a small group session (tutorial / practical) on a topic.

  - Deliver a short talk on a topic on discussion.
  - Present a seminar on a topic.
  - Give a journal club presentation on a topic.
  - Construct proper SAQs, MCQs, SEQs essay questions and problem-based questions on different topics.
  - Conduct a simulated oral examination on a set of topics.
  - Construct OSPE stations (question / procedure station) on different topics.
  - Examine and mark answer scripts.
  - Use interactive CD-ROMs, on-line sources and other self-learning devices on different topics.

(Attitude)

- Behave sensibly in using laboratory equipment and materials in terms of apropriate use of manual, economical use of materials as well as carefulness and cleaniness.
- Put the equipments and materials in their proper locations after use.
- Take proper safety measures for oneself and for the group as a whole while working in labs/dissection hall.
- Demonstrate the appropriate attitude towards a cadaver and human organs / parts while engaged in dissecting and demonstrating them.
- Demonstrate the appropriate attitude towards learning and teaching of Human Abdomen, Pelvis and Perineum using updated understanding of the philosophy and techniques of Medical Education.

Course content

Abdomen

Overview: walls, cavities, regions and planes
Anterolateral abdominal wall

- Fasciae sheath and aponeuroses of the anterolateral abdominal wall
- Muscles of the anterolateral abdominal wall
- Neurovascular and lymphatic organisation of the anterolateral abdominal wall
- Internal surface of anterolateral abdominal wall
- Inguinal region, including the inguinal canal.

Peritoneum and peritoneal cavity

- Extraperitorual (including retro peritoneal) and intraperitoneal structures.
- Peritoneal formations- pouches, recesses, spaces, gutters, ligaments, fasciae, sheaths, mesenteries and omenta.
- Subdivisions of the peritoneal cavity

Abdominal viscera

- Overview of the abdominal viscera and digestive tract
- Oesophagus
- Stomach

- Small intestine- duodenum, jejunum and ileum
- Large Intestine- coelum and appendix ascending, trans and descending coluns and sigmoicl cotton.
- Spleen
- Pancreas
- Liver
- Bilary ducts and gallbladder
- Kidney, ureter, and suprarenal glands
- Abdominal aorta and its branches
- Inferior vena cava and its tributarics
- Neurovascular and hymphatic organization of the abdominal cavity.

Diaphragm

- Vessels and nerves of the diaphragm
- Diaphragmatic apertures
- Actions of the diaphragm

Posterior abdominal wall

- Fasciae of the posterior abdominal wall
- Muscles of the posterior abdominal wall
- Lumbar region including the renal angle and lumbar triangle
- Neurovascular and lymphatic organization of the posterior abdominal wall

Pelvis and Perineum

Introduction to the pelvis, including the types Pelvic girdle

- Bones and features of the pelvic girdle in males and females 9including measurements relatied to pregnancy)
- Pelvic inlet and outlet
- Orientations of the pelvic girdle in males and females
- Joints and ligaments of the pelvic girdle

Pelvic Cavity

- Walls and floor of the pelvic cavity
- Peritoneum and peritoneal cavity of the pelvis
- Pelvic fascia

Neurovascular lymphatic organization of the pelvis.

Pelvic viscera

- Terminal ureter, urinary bladder and urethra (male and femal)
- Rectum and anal canal
- Male internal genital organs: Vas deferens, seminal vesicle ejaccelatory duct and prostate.
- Female intsnal genital organs: Ovaries, uterine tubes, uterus and vagina.

Perineum

- Fasciae and pouches of the urogenital triangle
- Features of the anal triangle
- Male urogenital triangle including the scrotum, testis epidydimis and spermatic cord
- Female urogenital triangle including the vulva and perineal

Aspects of the pelvis and perineum in relation to pregnancy and parturituon

The following aspects of the above topics should be covered in auditory, visual and taetile ways (as applicable)

- Regional and functional anatomy
- Sectional anatomy at important planes
- Surface anatomy of important structures (a list is provided)
- Normal common and important diagnostic images (a list is provided) and these important clinical implications.
- Anatomy of common and important physiological processes (a list is provided)
- Anatomy of important clinical procedures (a list is provided)
- Anatomy of common and important acquired clinical disorders (a list is provided)
- Development of important parts, organs and structures and developmental mechanisms of common and important related anomalies
- Histology of important organs and structures and this common and important clinical implications.

Special placements

Places where practical exposure to common surgeries and procedures like endoscopy are possible.

Educational Strategy

As outlined in Section A-10 and as is applicable to the specific objectives of the Block.

Learning Methods

As outlined in Section A-10 and as are applicable to the specific objectives of the Block.

Assessment

As outlined in Section A-14 and as is applicable to the specific objectives of the Block.

B:4 Phase- A Year- 2 Block- 4 (PAY2B4)

B:4.1 Human Head and Neck

Specific objectives

After completing this part of the Block, the residents should be able to do the following in relation to Human Head and Neck:

(Knowledge)

- Define and differentiate between the important and common anatomical terms related to the region (including 'head', neck', 'skul' and 'cranium').
- Describe different parts and structures of the region in terms of locations, extent, anatomical positions, gross features and relations.
- Explain the principles (mode) of arterial supplies and general plan of venous drainages and lymphatic drainages of the region.
- Describe the arterial supplies, venous drainages, lymphatic drainages and nerve supply of the individual organs and parts of the region (the details of the individual nerves and nerve plexuses are covered in Neuroanatomy).
- Describe the origins, divisions, courses, branches, areas of supply and effects of blockage/ severing of the important arteries of the region, and explain them using anatomical logic.
- Describe the formations, terminations, tributeries, areas of drainage and effects of blockage/ severing of the important veins of the region, and explain them using anatomical logic.
- Describe the collateral circulations that may develop to compensate the blockage/ severing of the important vessels of the region and explain them using anatomical logic.
- Describe the origins, insertions, actions, participation in movements, relations etc. (as applicable) of important individual muscles of the region.
- Describe the types, formations, participation in movements (including plans and axes), blood supplies, nerve supplies, relations etc. (as applicable) of important individual joints.
- Mention the locations of the important ossification centres in the bones and outline their times of appearance and fusion with shaft/ body.
- Describe the various parts of the skeleton and bones of the region along with the important attachments and relations.
- Explain the functional anatomy of the common physiological process (including everyday activities) drawing functional correlations with anatomical structures.
- Describe and explain the anatomical aspects of the common clinical procedures.
- Describe and explain the normal development of different organs/parts and the relevant developmental anomalies.
- Describe the light and electron microscopic features (as applicable) of important cells, tissues and organs, and correlate the structural features with specific functions.

(Skill)

- Identify different anatomical parts and structures in cadavers/viscera/skeleton/bones/model/illustrations (including sectional views)/living body.
- Demonstrate the understanding of the relative orientation of different structures in various parts of this region.
- Demonstrate the understanding of the functional locations and orientations of individual bones in the skeleton, thus emphasizing the skeleton as a functional whole rather than a mere collection of bones.
- Perform dissection on cadavers/viscera to reveal and identify anatomical structures.
- Demonstrate the movement occuring at a joint showing respective planes, axes, as well as the muscles acting as prime mover, antagonist, synergists, and fixators.
- Draw and/label relevant anatomical structures (including sectional views)/processes/phenomena.
- Identify the light and electron microscopic features of important cells, tissue components, tissues and organs as well as the important cellular and histological events in different forms of figures (e.g., micrographs, realistic drawings, schematic drawings, flow charts) and models related to above topics.
- Outline the surface projections of important structures on the body surface.
- Palpate different bony, muscular and other prominences of this region on the livingbody.
- Identify and explain the normal structures and common related abnormalities in diagnostic images.
- Demonstrate important body functions related to anatomy of this region.
- Solve the clinical problems related to this region.
- Demonstrate the ability to solve common clinical problems by the application of knowledge to this region in narrated and simulated cases.
- Identify different developmental stages, phenomena and mechanism of the different organs/parts of this region in different forms of illustrations, models and specimens.
- Identify different developmental anomalies of this region in the different forms of illustrations, models and specimens.
- Identify different acquired clinical disorders.
- Perform tissue preparation, sectioning, staining and mounting for routine microscopy (as well as for some important special staining) and explain the significance of various steps.
- Demonstrate several of the following abilities (as instructed) in relation to Human Head and Neck:
    - Prepare a lesson plan for a large group session (lecture) on a topic.
    - Prepare a lesson plan for a small group session (tutorial / practical) on a topic.
    - Prepare a handout for a large or small group session on a topic.
    - Prepare a good overlaying OHP transparency on a topic.
    - Prepare a good static/animated multimedia slide on a topic.
    - Prepare a model on a topic.
    - Run a small group session (tutorial / practical) on a topic.
    - Deliver a short talk on a topic on discussion.
    - Present a seminar on a topic.
    - Give a journal club presentation on a topic.
    - Construct proper SAQs, MCQs, SEQs essay questions and problem-based questions on different topics.

- Conduct a simulated oral examination on a set of topics.
- Construct OSPE stations (question / procedure station) on different topics.
- Examine and mark answer scripts.
- Use interactive CD-ROMs, on-line sources and other self-learning devices on different topics.

(Attitude)

- Behave sensibly in using laboratory equipment and materials in terms of apropriate use of manual, economical use of materials as well as carefulness and cleaniness.
- Put the equipments and materials in their proper locations after use.
- Take proper safety measures for oneself and for the group as a whole while working in labs/dissection hall.
- Demonstrate the appropriate attitude towards a cadaver and human organs / parts while engaged in dissecting and demonstrating them.
- Demonstrate the appropriate attitude towards learning and teaching of Human Head and Neck using updated understanding of the philosophy and techniques of Medical Education.

Course content

Head

(Skull cranium and mandible)

- Frontal aspect of the cranium
- Lateral aspect of the cranium
- Occipital aspect of the cranium
- Superior aspect of the cranium
- External surface of the cranial base
- Internal surface of the cranial base
- Walls of cranial the cavity
- Regions of the head

Face and scalp

- Face
- Scalp
- Muscles of the face and scalp

Eyes, orbit, orbital region and eyeballs

- Orbit and fascial arrangement
- Eyelids lacrimal apparatus and eyebrow
- Eyeball
- Extraocular muscles of the orbit

Parotid and tempotal regions infratemporal fossa and temporomandibular joints

- Parotid region
- Temporal region
- Infratemporal fossa
- Temporomandibular joint

Oral region

- Oral cavity
- Lips, cheeks and gingivae and vestibule
- Teeth
- Palate: hard and soft
- Tongue
- Salivary glands
- Palatine tonsil as part of the Waldeyer's

Pterygopalatine fossae

- Boundaries
- Contents, including:
  pterygopalatine part of maxillary artery
  maxillary nerve pterygoid venous plexas

Nose

- External nose
- Nasal cavities and lateral nasal walls
- Nasal septum
- Paranasal sinuses

Ear

- External ear
- Middle ear
- Internal ear

Neurovascular and lymphatic organizations of the head

Neck

Bones of neck

- Cervical vertebrae
- Hyoid bone

Fascia of neck

- Cervical subcutaneous tissue and platysma
- Deep cervical fascia, 1st specializations and their contents
- Spaces of clinical imp.

Supperficial Structures of neck :

Cervical regions

- Sternocleidomastoid region
- Posterior cervical region
- Leteral cervical region
- Anterior cervical region
- Triangular organization of the neck

Deep structures of neck

- Prevertebral muscles
- Root of the neck

Viscera of neck

- Endocrine layer of the cervical viscera: thyroid and parathyroid glands
- Respiratory layer of the cervical viscera: larynx and trachea
- Alimentary layer of the cervical viscera: pharynx and oesophagus

Neurovascular and lymphatic organizations of the neck

Lymphatics of neck

The following aspects (as applicable) of the above topics should be covered:

- Regional and functional anatomy, including blood vessels, nerves, lymphnodes and lymphatics
- Sectional anatomy of important planes
- Surface anatomy of important structures (a list is provided)
- Normal common diagnostic images (a list is provided)
- Anatomy of important and relevant physiological process (a list is provided)
- Anatomy of important clinical procedures (a list is provided)
- Anatomy of important clinical disorders (a list is provided)
- Development of important organs and structures and related anomalies of head neck region.
- Histology of important organs and structures and related anomalies of head neck region.

Special placements

Places where practical exposure to common clinical procedures and disorders are possible.

Educational Strategy

As outlined in section A-10 and as applicable

Learning Methods

As outlined in section A-10 and as applicable

Assessment

As outlined in section A-14 and as applicable

B:4.2 Neuroanatomy

Specific objectives

After completing this part of the Block, the residents should be able to:

(**Knowledge):**

- Define and differentiate between the common and important terms related to Neuroanatomy.
- Describe the organisation of the nervous system, including its parts and subdivisions- anatomical and functional.
- Describe different parts of the brain, the spinal cord, the important peripheral nerves (including their nuclei, courses, branches and distributions), the sensory and autonomic ganglia ,the limb plexuses and autonomic plexuses, and the important neuroanatomical connections (including specific tracts and pathways for specific sensory and motor functions) as well as correlate the anatomical knowledge with functional and clinical applications.
- Describe ways of studying the structure of the cells and other components of the nervous system.
- Describe the functional neuroanatomy of the motor system from planning to execution, including muscle tone, reflexes and motor coordination, with special references to the cerebellum, basal ganglia and reticular formation, and correlate the knowledge with relevant clinical aspects.
- Describe the functional neuroanatomy of the sensory system, with special reference to the thalamus, and correlate the knowledge with relevant clinical aspects.
- Describe the functional neuroanatomy of the autonomic system, with special reference to the hypothalamus, and correlate the knowledge with relevant clinical aspects.
- Describe the functional neuroanatomy related to the basic higher psychic functions, with special reference to the limbic system, and correlate knowledge with relevant clinical aspects.
- Describe the important vascular anastomoses & explain their functional & clinical singnificance.
- Describe the arterial supply and venous drainage of the nervous system and explain the effects of rupture or occlusion of the major vessels.
- Describe the sources, formation, circulation and drainage of the CSF and explain its functional and clinical implications.
- Describe the development of the different components and parts of the nervous system and explain why and how the common developmental anomalies occur.

- Describe and explain impulse transmission from neuron to neuron and from neuron to effecter cell, including the structural specializations and neurotransmitters/ neuromodulators that are responsible for transmission.
- Explain the mechanism of different developmental anomalies of the above topic in the different forms of illustrations, models and specimens.
- Explain the neuroanatomical mechanisms of common physiological processes.
- Describe and explain neuronal regeneration.

(Skill)

- Identify different parts of the brain, spinal cord and peripheral nervous system (including their sectional features) and the vessels supplying those parts in specimens, cadavers, models and figures.
- Demonstrate the surface anatomy of the important parts of the brain, of spinal segments and of the important peripheral nerves.
- Describe the ways of studying the structure of the cells and other components of the nervous system.
- Identify the light and electron microscopic structure of the neuronal and non-neuronal components of the nervous system and their orientation from the cellular to the tissue levels, and correlate the structural features with their functional implications.
- Identify and demonstrate different structures in Neuroanatomy-related sections under microscope
- Draw and label different parts and components of the nervous system, including ultrastructure of cells and sectional views of the brain and spinal cord, important connections, nerves and nerve plexuses, supply areas (e.g., dermatomes) , blood vessels and their supply areas as well as various neuroanatomical phenomena.
- Identify the important neuroanatomical phenomena in figures (e.g., neuronal transmission, neuronal regeneration, development of the nervous system).
- Test an individual for the motor /sensory integrity of important peripheral nerves (cranial and spinal), for general sensory functions, for important reflexes and for motor coordination and equilibrium.
- Identify the different structures of above topic in conventional radiographs, CT scans, MRI images, myelograph etc.
- Demonstrate the neuroanatomy of the common neurological and neurosurgical procedures and disorders.
- Demonstrate the ability to solve common clinical problems by the application of neuroanatomical knowledge in narrated and simulated cases.
- Solve the clinical problems related to Neuroanatomy.
- Demonstrate several of the following abilities (as instructed) in relation toNeuroanatomy:
    - Prepare a lesson plan for a large group session (lecture) on a topic.
    - Prepare a lesson plan for a small group session (tutorial / practical) on a topic.
    - Prepare a handout for a large or small group session on a topic.
    - Prepare a good overlaying OHP transparency on a topic.
    - Prepare a good static/animated multimedia slide on a topic.
    - Prepare a model on a topic.
    - Run a small group session (tutorial / practical) on a topic.
    - Deliver a short talk on a topic on discussion.
    - Present a seminar on a topic.

    - Give a journal club presentation on a topic.
    - Construct proper SAQs, MCQs, SEQs essay questions and problem-based questions on different topics.
    - Conduct a simulated oral examination on a set of topics.
    - Construct OSPE stations (question / procedure station) on different topics.
    - Examine and mark answer scripts.
    - Use interactive CD-ROMs, on-line sources and other self-learning devices on different topics.

(**Attitude)**

- Beheave sensibly in using laboratory equipment and materials in terms of appropriate use of manual,economical use of materials as well as carefulness and cleanliness.
- Put the equipment and materials in their proper locations after use.
- Take proper safety measures for oneself and for the group as a whole while working in labs/dissection hall.
- Demonstrate the appropriate attitude towards a cadaver and human organs / parts while engaged in dissecting and demonstrating them.
- Demonstrate the appropriate attitude towards learning and teaching of Neuroanatomy using updated understanding of the philosophy and techniques of Medical Education.

Course content

Introduction and Organization of the Nervous System

- Central and peripheral nervous system
- Major divisions of the central nervous system
- Major divisions of the peripheral nervous system
- Early development of the nervous system

The Neurobiology of the Neuron and the Neuroglia

- Definition of a neuron
- Varieties of neurons
- Structure of the neuron
- Definition of neuroglia
- Astrocytes
- Oligodendrocytes
- Microglia
- Ependyma
- Extracellular space
- Nerve

Nerve Fibers, Peripheral Nerves, Receptor and Effector Endings, Dermatomes and Muscle Activity

- Nerve fibers
- Peripheral nerves
- Conduction in peripheral nerves
- Receptor endings
- Effector endings

- Segmental innervation of skin
- Segmental innervation of muscles
- Muscle tone and muscles action
- Summation of motor units
- Muscle fatigue
- Posture

The Spinal Cord and the Ascending and Descending Tracts

- A brief review of the vertebral column
- Gross appearance f the spinal cord
- Structure of the Spinal Cord
- The ascending tracts of the spinal cord
- Anatomical organization
- Functions of the ascending tracts
- The descending tracts of the spinal cord
- Anatomical organization
- Functions of the descending tracts
- Corticospinal tracts
- Reticulospinal tracts
- Tectospinal tracts
- Rubrospinal tracts
- Vestibulospinal tracts
- Olivospinal tracts
- Descending autonomic fibers
- Intersegmental tracts
- Reflex arc
- Influence of higher neuronal centers on the activities of the spinal reflexes
- Renshaw cells and lower motor neuron inhibition

The Brainstem

- A brief review of the skull
- The cranial cavity
- Introduction to the brainstem
- Gross appearance of the medulla oblongata
- Internal structure of the medulla oblongata
- Gross appearance of the pons
- Internal structure of the pons
- Gross appearance of the midbrain
- Internal structure of the midbrain

The Cerebellum and its Connections

- Gross appearance of the cerebellum
- Structure of the cerebellum
- Cerebellar cortical mechanisms

- Cerebellar afferent fibers
- Cerebellar efferent fibers
- Funtions of the cerebellum

The Cerebrum

- Subdivisions of the cerebrum
- Diencephalon
- General appearance of the cerebral hemispheres
- Main sulci
- Lobes of the cerebral hemisphere
- Internal structure of the cerebral hemispheres

The structure and functional localization of the cerebral cortex

- Structure of the cerebral cortex
- Mechanisms of the cerebral cortex
- Cortical areas
- Cerebral dominance

The Reticular Formation and the Limbic System

- Reticular formation
- Limbic system

The Basial Nuclei (Basal Ganglia) and Their Connections

- Terminology
- Corpus striatum
- Amygdaloid nucleus
- Substantia nigra and subthalamic nuclei
- Claustrum
- Connections of the corpus striatum and globus pallidus
- Connection of the corpus stratum
- Connection of the globus pallidus
- Function of the basal nuclei

The Cranial Nerve Nuclei and Their Central Connections and Distribution

- The 12 cranial nerves
- Organization of the cranial nerves
- Olfactory nerve
- Optic nerve
- Oculomotor nerve
- Trochlear nerve
- Trigeminal nerve

- Abducent nerve
- Facial nerve
- Vestibulocochlear nerve
- Glossopharyngeal nerve
- Vagus nerve
- Accessory nerve
- Hypoglossal nerve

The Thalamus and its Connections

- General appearances of the thalamus
- Subdivisions of the thalamus
- Connections of the thalamus
- Function of the thalamus

The Hypothalamus and Its Connections

- The hypothalamus
- Hypothalamic nuclei
- Afferent nervous connections of the hypothalamus
- Efferent nervous connections of the hypothalamus with the hypophysis cerebri
- Functions of the hypothalamus

The Autonomic Nervous System

- Organization of the autonomic nervous system
- The large autonomic plexuses
- Autonomic ganglia
- Preganglionic transmitters
- Fast, slow, and inhibitory synaptic potentials
- Ganglion stimulating agents
- Ganglion blocking agents
- Postganglionic nerve ending
- Postganglionic transmitters
- Other postganglionic transmitters
- Blocking of cholinergic receptors
- Blocking of adrenergic receptors
- Higher control of the autonomic nervous system
- The “enteric nervous system”
- Functions of the autonomic nervous system
- Important anatomical, physiologic, and pharmacologic differences between the some important autonomic innervations
- Some important autonomic innervations
- Some important physiological reflexes involving the autonomic nervous system clinical notes

The Meninges of the Brain and Spinal Cord

- Meninges of the brain
- Meninges of the spinal cord
- Dural venous sinuses

The Ventricular System the Cerebrospinal Fluid, and the Blood-Brain and Blood- Cerebrospinal Fluid Barriers

- Ventricular system
- Subrachnoid space
- Cerebrospinal fluid
- Blood-brain and blood- cerebrospinal fluid barriers

The Blood Supply of the Brain and the Spinal Cord

- Blood supply of the brain
- Brain capillaries
- Cerebral circulation
- Blood supply of the spinal cord

The Development of the Nervous System

- Spinal cord
- Brain

Anatomy of physiological activities like:

- Breathing
- Walking
- Micturition
- Defaecation
- Vomiting
- Coughing & sneezing
- Temperature Regulation
- Gait & posture
- Hunger & thirst
- Swallowing

- BP regulation (including heart rate)
- Sweating
- Erection & ejaculation
- Orgasm
- Dream
- Phonation
- Parturition
- Sleep
- Lactation

Special placements

- Places where practical exposure to common clinical procedures and disorders are possible.

Educational Strategy

- As outlined in section A-10 and as applicable

Learning Methods

- As outlined in section A-10 and as applicable

Assessment

- As outlined in section A-14 and as applicable

B:5 Phase- A Year- 2 Block- 5 (PAY2B5)

B:5.1 HumanThorax (Including Breast), Back & Vertebral Column

Specific objectives

After completing this part of the block, the residents should be able to do the bfollowing related to Human Thorax (including Breast), Back and Vertibral Column:

(Knowledge)

- Define and differentiate between the important and common anatomical terms related to the region.
- Describe different parts and structures of the region in terms of locations, extent, anatomical positions, gross features and relations.
- Explain the principles (mode) of arterial supplies and general plan of venous drainages and lymphatic drainages of the region.
- Describe the arterial supplies, venous drainages, lymphatic drainages and nerve supply of the individual organs and parts of the region (the details of the individual nerves and nerve plexuses are covered in Neuroanatomy).
- Describe the origins, divisions, courses, branches, areas of supply and effects of blockage/ severing of the important arteries of the region, and explain them using anatomical logic.
- Describe the formations, terminations, tributeries, areas of drainage and effects of blockage/ severing of the important veins of the region, and explain them using anatomical logic.
- Describe the collateral circulations that may develop to compensate the blockage/ severing of the important vessels of the region and explain them using anatomical logic.
- Describe the origins, insertions, actions, participation in movements, relations etc. (as applicable) of important individual muscles of the region.
- Describe the types, formations, participation in movements (including plans and axes), blood supplies, nerve supplies, relations etc. (as applicable) of important individual joints.
- Mention the locations of the important ossification centres in the bones and outline their times of appearance and fusion with shaft/ body.
- Describe the various parts of the skeleton and bones of the region along with the important attachments and relations.
- Explain the functional anatomy of the common physiological process (including everyday activities) drawing functional correlations with anatomical structures.
- Describe and explain the anatomical aspects of the common clinical procedures.
- Describe and explain the normal development of different organs/parts and the relevant developmental anomalies.
- Describe the light and electron microscopic features (as applicable) of important cells, tissues and organs, and correlate the structural features with specific functions.

(Skill)

- Identify different anatomical parts and structures in cadavers/viscera/skeleton/bones/model/illustrations (including sectional views)/living body.
- Demonstrate the understanding of the relative orientation of different structures in various parts of this region.
- Demonstrate the understanding of the functional locatrions and orientations of individual bones in the skeleton, thus emphasizing the skeleton as a functional whole rather than a mere collection of bones.
- Perform dissection on cadavers/viscera to reveal and identify anatomical structures.
- Demonstrate the movement occuring at a joint showing respective planes, axes, as well as the muscles acting as prime mover, antagonist, synergists, and fixators.

- Draw and/label relevant anatomical structures (including sectional views)/processes/phenomena.
- Identify the light and electron microscopic features of important cells, tissue components, tissues and organs as well as the important cellular and histological events in different forms of figures (e.g., micrographs, realistic drawings, schematic drawings, flow charts) and models related to above topics.
- Outline the surface projections of important structures on the body surface.
- Palpate different bony, muscular and other prominences of this region on the livingbody.
- Identify and explain the normal structures and common related abnormalities in diagnostic images.
- Demonstrate important body functions related to anatomy of this region.
- Solve the clinical problems related to this region.
- Demonstrate the ability to solve common clinical problems by the application of knowledge of to this region in narrated and simulated cases.
- Identify different developmental stages, phenomena and mechanism of the different organs/parts of this region in different forms of illustrations, models and specimens.
- Identify different developmental anomalies of this region in the different forms of illustrations, models and specimens.
- Identify different acquired clinical disorders.
- Perform tissue preparation, sectioning, staining and mounting for routine microscopy (as well as for some important special staining) and explain the significance of various steps.

- Demonstrate several of the following abilities (as instructed) in relation to Human Thorax (including Breast), Back & Vertebral Column:
  - Prepare a lesson plan for a large group session (lecture) on a topic.
  - Prepare a lesson plan for a small group session (tutorial / practical) on a topic.
  - Prepare a handout for a large or small group session on a topic.
  - Prepare a good overlaying OHP transparency on a topic.
  - Prepare a good static/animated multimedia slide on a topic.
  - Prepare a model on a topic.
  - Run a small group session (tutorial / practical) on a topic.
  - Deliver a short talk on a topic on discussion.
  - Present a seminar on a topic.
  - Give a journal club presentation on a topic.
  - Construct proper SAQs, MCQs, SEQs essay questions and problem-based questions on different topics.
  - Conduct a simulated oral examination on a set of topics.
  - Construct OSPE stations (question / procedure station) on different topics.
  - Examine and mark answer scripts.
  - Use interactive CD-ROMs, on-line sources and other self-learning devices on different topics.

(Attitude)

- Behave sensibly in using laboratory equipment and materials in terms of apropriate use of manual, economical use of materials as well as carefulness and cleaniness.
- Put the equipment and materials in their proper locations after use.

- Take proper safety measures for oneself and for the group as a whole while working in labs/dissection hall.
- Demonstrate the appropriate attitude towards a cadaver and human organs / parts while engaged in dissecting and demonstrating them.
- Demonstrate the appropriate attitude towards learning and teaching of Human Thorax (Including Breast), Back & Vertebral Column using updated understanding of the philosophy and techniques of Medical Education.

Course Content

Overview of thorax

Thoracic wall

- Skeleton of the thoracic wall
- Thoracic apertures
- Joints of the thoracic wall
- Movements of thoracic wall and their functional significance
- Intercostals space
- Muscles of the thoracic wall
- Fascia of the thoracic wall

Breasts

- Thoracic cavity and its contents
- Pleurae
- lungs, and tracheobronchial tree
- Superior mediastinum
- Inferior mediastinum (anterior, middle and posterior)
- Thoracic oesophagus
- Pricardium
- Heart
- Thoracic duct and right lymphatic duct
- Azygos venous system
- Neurovascular and lymphatic organization of the thorax 9including the breast)

Back

Fascial organisation of the back

Vertebral column

- Structure and function of the vertebrae
- Regional characteristics of the vertebrae with their functional implications
- Ossification of the vertebrae

- Variations in the vertebrae
- Overviews of the vertebral column
- Joints of vertebral column
- Movements of vertebral column, muscles producing them and their importance in everyday functions
- Curvatures of vertebral column
- Functional anatomy of the intervertebral disc

Muscles of the back

- Extrinsic back muscles
- Intrinsic back muscles
- Suboccipital and deep neck muscles
- Spinal cord of vertebral canal and its contents (basic organisatio the details of the spinal cord images CSF and spinal nerves are covered Human neuroanaotmy
- Intervertebral foramina and their contents

Neurovascular and lymphatic organization of the vertebral column

Special Placements

- Places where practical exposure to common clinical procedures and disorders are possible.

Educational Strategy

- As outlined in Section A-10 and as applicable

Learning Methods

- As outlined in Section A-10 and as applicable

Assessment

- As outlined in Section A-14 and as applicable

The following aspects (as applicable) of the above parts, organs and structures should be covered:

- Regional and functional anatomy, including general description and relations, arterial supply, venous drainage, nerve supply and lymphatic drainage
- Sectional anatomy at important body planes
- Surface anatomy of important organs or structures (a list is provided)
- Normal common diagnostic images (a list is provided)
- Anatomy related to important and relevant physiological processes (a list is provided)
- Anatomy related to important and relevant clinical procedures (a list is provided)
- Anatomy related to important and relevant clinical disorders (a list is provided)
- Development of important parts, organs and structures and related anomalies

- Histology of important organs and structures with basic pathological implications

B:5.2 Human Superior Extremity

Specific objectives

After completing this part of the block, the residents should be able to do the bfollowing related to Human Superior Extremity:

(Knowledge)

- Define and differentiate between the important and common anatomical terms related to the region.
- Describe different parts and structures of the region in terms of locations, extent, anatomical positions, gross features and relations.
- Explain the principles (mode) of arterial supplies and general plan of venous drainages and lymphatic drainages of the region.
- Describe the arterial supplies, venous drainages, lymphatic drainages and nerve supply of the individual organs and parts of the region (the details of the individual nerves and nerve plexuses are covered in Neuroanatomy).
- Describe the origins, divisions, courses, branches, areas of supply and effects of blockage/ severing of the important arteries of the region, and explain them using anatomical logic.
- Describe the formations, terminations, tributaries, areas of drainage and effects of blockage/ severing of the important veins of the region, and explain them using anatomical logic.
- Describe the collateral circulations that may develop to compensate the blockage/ severing of the important vessels of the region and explain them using anatomical logic.
- Describe the origins, insertions, actions, participation in movements, relations etc. (as applicable) of important individual muscles of the region.
- Describe the types, formations, participation in movements (including plans and axes), blood supplies, nerve supplies, relations etc. (as applicable) of important individual joints.
- Mention the locations of the important ossification centres in the bones and outline their times of appearance and fusion with shaft/ body.
- Describe the various parts of the skeleton and bones of the region along with the important attachments and relations.
- Explain the functional anatomy of the common physiological process (including everyday activities) drawing functional correlations with anatomical structures.
- Describe and explain the anatomical aspects of the common clinical procedures.
- Describe and explain the normal development of different organs/parts and the relevant developmental anomalies.
- Describe the light and electron microscopic features (as applicable) of important cells, tissues and organs, and correlate the structural features with specific functions.

(Skill)

- Identify different anatomical parts and structures in cadavers/skeleton/bones/model/illustrations (including sectional views)/living body.
- Demonstrate the understanding of the relative orientation of different structures in various parts of this region.
- Demonstrate the understanding of the functional locatrions and orientations of individual bones in the skeleton, thus emphasizing the skeleton as a functional whole rather than a mere collection of bones.
- Perform dissection on cadavers/viscera to reveal and identify anatomical structures.
- Demonstrate the movement occuring at a joint showing respective planes, axes, as well as the muscles acting as prime mover, antagonist, synergists, and fixators.
- Draw and/label relevant anatomical structures (including sectional views)/processes/phenomena.
- Outline the surface projections of important structures on the body surface.
- Palpate different bony, muscular and other prominences of this region on the livingbody.
- Identify and explain the normal structures and common related abnormalities in diagnostic images.
- Demonstrate important body functions related to anatomy of this region.
- Solve the clinical problems related to this region.
- Demonstrate the ability to solve common clinical problems by the application of knowledge of to this region in narrated and simulated cases.
- Identify different developmental stages, phenomena and mechanism of the different organs/parts of this region in different forms of illustrations, models and specimens.
- Identify different developmental anomalies of this region in the different forms of illustrations, models and specimens.
- Identify different acquired clinical disorders.

- Demonstrate several of the following abilities (as instructed) in relation to Human Superior Extremity:
  - Prepare a lesson plan for a large group session (lecture) on a topic.
  - Prepare a lesson plan for a small group session (tutorial / practical) on a topic.
  - Prepare a handout for a large or small group session on a topic.
  - Prepare a good overlaying OHP transparency on a topic.
  - Prepare a good static/animated multimedia slide on a topic.
  - Prepare a model on a topic.
  - Run a small group session (tutorial / practical) on a topic.
  - Deliver a short talk on a topic on discussion.
  - Present a seminar on a topic.
  - Give a journal club presentation on a topic.
  - Construct proper SAQs, MCQs, SEQs essay questions and problem-based questions on different topics.
  - Conduct a simulated oral examination on a set of topics.
  - Construct OSPE stations (question / procedure station) on different topics.
  - Examine and mark answer scripts.
  - Use interactive CD-ROMs, on-line sources and other self-learning devices on different topics.

(Attitude)

- Behave sensibly in using laboratory equipment and materials in terms of apropriate use of manual, economical use of materials as well as carefulness and cleaniness.
- Put the equipment and materials in their proper locations after use.
- Take proper safety measures for oneself and for the group as a whole while in lab working/dissection hall.
- Demonstrate the appropriate attitude towards a cadaver and human organs / parts while engaged in dissecting and demonstrating them.
- Demonstrate the appropriate attitude towards learning and teaching of Human Superior Extremity using updated understanding of the philosophy and techniques of Medical Education.

Course Content

Overview

Comparison of upper and lower limbs

- Bones and Upper Limbs
- Clavicle
- Scapula
- Humerus
- Bones of forearm
- Bones of hand
- Surface anatomy of upper limb

Fascia efferent vessels cutaneous innervation and myotomes of upperlimb

- Fascia of upper limb
- Venous drainage of upper limb
- Lymphatic drainage of upper limb
- Cutaneous innervation of upper limb
- Motor innervation of upper limb

Pectoral and scapular regions

- Anterior axioappendicular and scapulohumeral muscles
- Scapulohymeral (intrinsic shoulder) muscles
- Surface anaromy of pectoral scapular, and deltoid regions
- Axilla
- Axillary artery
- Axillary vein
- Axillary lymph nodes
- Brachial plexus

Arm

- Muscles of arm
- Brachial artery
- Veins of arm
- Nerves of arm
- Cubital fossa
- Surface anatomy of arm and cibital fossa

Forearm

- Compartments of forearm
- Arteries of forearm
- Nerves of forearm
- Veins of forearm

Hand

- Fascia and compartments of palm
- Muscles of hand
- Long flexor tendons and tendon sheaths in hand
- Arteries of hand
- Veins of hand
- Nerves of hand
- Surface anatomy of hand

Joints of upper limb

- Sternoclavicular joint
- Acromioclavicular joint
- Glenohumeral joint
- Elbow joint
- Proximal radio-ulnar joint
- Distal radio-ulnar joint
- Distal radio-ulnar joint
- Wrist joint
- Intercarpal joint
- Carpometacarpal and intermetacarpal joints
- Metacarpophalangeal and interphalangeal joints

The following aspects (as applicable) of the above topics should be covered:

- Regional and functional anatomy, including blood vessels, nerves, lymphnodes and lymphatics
- Sectional anatomy of important planes
- Surface anatomy of important structures (a list is provided)
- Normal common diagnostic images (a list is provided)

- Anatomy of important and relevant physiological process (a list is provided)
- Anatomy of important clinical procedures (a list is provided)
- Anatomy of important clinical disorders (a list is provided)
- Development of important organs and structures and related anomalies of human superior extremity

Special Placement

- Places where practical exposure to common clinical procedures and disorders are possible.

Educational Strategy

- As outlined in section A-10 and as applicable

Learning Methods

- As outlined in section A-10 and as applicable

Assessment

- As outlined in section A-14 and as applicable

B:5.3 Human Inferior Extremity

Specific objectives

After completing this part of the block, the residents should be able to do the bfollowing related to Human Thorax (including Breast), Back and Vertibral Column:

(Knowledge)

- Define and differentiate between the important and common anatomical terms related to the region.
- Describe different parts and structures of the region in terms of locations, extent, anatomical positions, gross features and relations.
- Explain the principles (mode) of arterial supplies and general plan of venous drainages and lymphatic drainages of the region.

- Describe the arterial supplies, venous drainages, lymphatic drainages and nerve supply of the individual organs and parts of the region (the details of the individual nerves and nerve plexuses are covered in Neuroanatomy).
- Describe the origins, divisions, courses, branches, areas of supply and effects of blockage/ severing of the important arteries of the region, and explain them using anatomical logic.
- Describe the formations, terminations, tributeries, areas of drainage and effects of blockage/ severing of the important veins of the region, and explain them using anatomical logic.
- Describe the collateral circulations that may develop to compensate the blockage/ severing of the important vessels of the region and explain them using anatomical logic.
- Describe the origins, insertions, actions, participation in movements, relations etc. (as applicable) of important individual muscles of the region.
- Describe the types, formations, participation in movements (including plans and axes), blood supplies, nerve supplies, relations etc. (as applicable) of important individual joints.
- Mention the locations of the important ossification centres in the bones and outline their times of appearance and fusion with shaft/ body.
- Describe the various parts of the skeleton and bones of the region along with the important attachments and relations.
- Explain the functional anatomy of the common physiological process (including everyday activities) drawing functional correlations with anatomical structures.
- Describe and explain the anatomical aspects of the common clinical procedures.
- Describe and explain the normal development of different organs/parts and the relevant developmental anomalies.
- Describe the light and electron microscopic features (as applicable) of important cells, tissues and organs, and correlate the structural features with specific functions.

(Skill)

- Identify different anatomical parts and structures in cadavers/skeleton/bones/model/illustrations (including sectional views)/living body.
- Demonstrate the understanding of the relative orientation of different structures in various parts of this region.
- Demonstrate the understanding of the functional locatrions and orientations of individual bones in the skeleton, thus emphasizing the skeleton as a functional whole rather than a mere collection of bones.
- Perform dissection on cadavers/viscera to reveal and identify anatomical structures.
- Demonstrate the movement occuring at a joint showing respective planes, axes, as well as the muscles acting as prime mover, antagonist, synergists, and fixators.
- Draw and/label relevant anatomical structures (including sectional views)/processes/phenomena.
- Outline the surface projections of important structures on the body surface.
- Palpate different bony, muscular and other prominences of this region on the livingbody.
- Identify and explain the normal structures and common related abnormalities in diagnostic images.

- Demonstrate important body functions related to anatomy of this region.
- Solve the clinical problems related to this region.
- Demonstrate the ability to solve common clinical problems by the application of knowledge of to this region in narrated and simulated cases.
- Identify different developmental stages, phenomena and mechanism of the different organs/parts of this region in different forms of illustrations, models and specimens.
- Identify different developmental anomalies of this region in the different forms of illustrations, models and specimens.
- Identify different acquired clinical disorders.
- Demonstrate several of the following abilities (as instructed) in relation to Human Inferior Extremity:
    - Prepare a lesson plan for a large group session (lecture) on a topic.
    - Prepare a lesson plan for a small group session (tutorial / practical) on a topic.
    - Prepare a handout for a large or small group session on a topic.
    - Prepare a good overlaying OHP transparency on a topic.
    - Prepare a good static/animated multimedia slide on a topic.
    - Prepare a model on a topic.
    - Run a small group session (tutorial / practical) on a topic.
    - Deliver a short talk on a topic on discussion.
    - Present a seminar on a topic.
    - Give a journal club presentation on a topic.
    - Construct proper SAQs, MCQs, SEQs essay questions and problem-based questions on different topics.
    - Conduct a simulated oral examination on a set of topics.
    - Construct OSPE stations (question / procedure station) on different topics.
    - Examine and mark answer scripts.
    - Use interactive CD-ROMs, on-line sources and other self-learning devices on different topics.

(Attitude)

- Behave sensibly in using laboratory equipment and materials in terms of apropriate use of manual, economical use of materials as well as carefulness and cleaniness.
- Put the equipments and materials in their proper locations after use.
- Take proper safety measures for oneself and for the group as a whole working in lab/dissection hall.
- Demonstrate the appropriate attitude towards a cadaver and human organs / parts while engaged in dissecting and demonstrating them.
- Demonstrate the appropriate attitude towards learning and teaching of Human Inferior Extremity using updated understanding of the philosophy and techniques of Medical Education.

Course Content

Lower Limb

Overview of Lower Limb

Development of Lower Limb

Bones of Lower Limb

- Arrangement of lower limb bones
- Hip bone
- Femur
- Tibia and fibula
- Bones of foot

Surface anatomy of bones of foot

Fascia, veins, lymphatics, efferent, vessels, and cutaneous nerves of lower limb

- Subcutaneous tissue and fascia
- Venous drainage of lower limb
- Lymphatic drainage of lower limb
- Cutaneous innervation of lower limb
- Motor innervations of lower limb.

Posture and gait

- Standing at ease
- Walking: the gait cycle

Anterior and medial regions

- Organization of proximal lower limb
- Anterior thigh muscles
- Medial thigh muscles
- Neurovascular structures and relationship in anteromedial thigh
- Surface anatomy of anterior and medial regions of thigh

Gluteal and posterior thigh regions

- Gluteal region: buttocks and hip region
- Muscles of gluteal region
- Neurovascular structure of gluteal and posterior
- Thigh regions
- Surface anatomy of gluteal and posterior
- Thigh regions

Popliteal fossa and leg

- Popliteal region
- Anterior compartment of leg
- Lateral compartment of leg
- Posterior compartment of leg

- Surface anatomy of leg

Foot

- Skin and fascia of foot
- Muscles of foot
- neurovascular structure and relationship in foot
- Surface anatomy of ankle region and foot
- Joints of lower limb
- Hip joints
- Knee joints
- tibiofibular joints
- Ankle joint
- Foot joints
- Surface anatomy of joints of knee , ankle and foot

The following aspects (as applicable) of the above topics should be covered:

- Regional and functional anatomy, including blood vessels, nerves, lymphnodes and lymphatics
- Sectional anatomy at important planes
- Surface anatomy of important structures (a list is provided)
- Normal common diagnostic images (a list is provided)
- Anatomy of important and relevant physiological process (a list is provided)
- Anatomy of important clinical procedures (a list is provided)
- Anatomy of important clinical disorders (a list is provided)
- Development of important organs and structures and related anomalies of human inferior extremity.

Special Placement

- Places where practical exposure to common clinical procedures and disorders are possible.

Educational Strategy

- As outlined in section A-10 and as applicable

Learning Methods

- As outlined in section A-10 and as applicable

Assessment

- As outlined in section A-14and as applicable

B:5.4 Research Methodology & Medical Statistics

Specific Objectives

Yet to be formulated

Course Content

Basic concept of medical research
Tools used in medical research: Rate, Ratio, measure of occurrence, Morbidity measure: Prevalence, incidence and other measure, Mortality measure, Standardization of rates, Different types of studies and their alternative names
Introduction to Bio- Statistics
Definition, Types, Uses and Importance of bio-statistics in health
Data, type of data
Concept of Variables and
Scale of measurements
Data Presentation
Tabular and graphical presentation: Preparation of frequency tables. Bar diagram, Histogram, Pie-chart, stem and leaf plots and Box plots
Data summarization-I
Measures of central tendency: Mean, Median, Mode.
Positional measures: Quartiles, Deciles, Percentiles and quintiles

Data summarization-II
Measure of Dispersion (Absolute and relative measures): Range, inter-quartile range, Variance and Standard deviation, Co-efficient of variation, standard error (SE)

Probability, Normal distribution, Central limit theorem, Skewness, Kurtosis
Study designs: Cross sectional study
Steps
Sample size for estimation of prevalence of some characteristics
Common sampling techniques for cross sectional studies
Estimation of Prevalence
Strength and weakness
Study designs: Case control study
Methods for selection of sample for case control studies
Estimation of minimum required sample size
Measurement of exposure
Potential biases
Odds ratios and its interpretation
Strength and weakness
Study designs: Cohort study
Methods for selection of sample for cohort studies

Estimation of minimum required sample size
Measurement of exposure and outcome, Potential biases
Relative risk and its interpretation
Case control vs. cohort study
Study designs:
Experimental/interventional study
Phase I-III trial
Estimation of bias and its control in studies
Common techniques to control biases
Understanding confounding and interactions
Confounding
How to handle research data in presence of confounding or interection
Validity and reliability
Sample and Sampling technique
Determination of sample size
Methods of data collection
Observation, Interview, Questionnaire
Advantage and disadvantage of different method of data collection
Form of question: Open ended, Close ended
Data collection tool
How to develop a questionnaire, Use of the questionnaire, Question wording, Question type, Scale: Likert scale,
Question order
Screening
Surveillance
Assessing the validity and reliability of diagnostic and screening tests
Validity of the screening test
Sensitivity, Specificity, PPV, NPV, Likelihood ratio
Some terms;

- Rule in, Rule out, Trade off etc
- ROC curve
- Bland Altman plot
- Kappa, Bias in screening

Statistical Inference, concept of estimation, uses and importance of confidence interval (CI), construction of CI
Test of hypothesis
General concept (definition, uses and importance), P-value, Types of error, level of significance, Power of test, setting null and alternative hypothesis, critical value, decision rule
Idea about normal test, t-test, chi-square test and F-test
Test of Hypothesis
Comparison of two means (Independent sample mean test, Paired sample test), Comparison of two proportion,
Comparison of several means. one way analysis of variance (ANOVA)
Test of Hypothesis
Test of independence of attributes
Chi-square –test and Fisher exact test
Idea about non-parametric test: Sign test, Wilcoxon-sign rank test, median test Kruskal-Wallis test
Correlation and Regression
Historical Events in Clinical Research

Nuremberg, Helsinki/ world medical association, Belmont, International Conferences on Harmonization (ICH),
Council for International Organizations of Medical Sciences (CIOMS)
Institutional Ethical Review Board (IERB)s
WHO guidelines, Nuffield Council guideline, Regulations in Research of Different Countries
Ethics in medical research
Ethical issues for involving human subjects in research, Good clinical practice, Role of Institutional Review Board, Role of Institutional ethical committee
How to write a consent form?
How to write protocol and thesis
Steps and presentation of thesis, referencing systems
Academic honesty and plagiarism:
Academic honesty, Collusion, Plagiarism, condensing, paraphrasing
University policy regarding plagiarism

Educational Strategy

As outlined in section A-10 and as applicable

Learning Methods

As outlined in section A-10 and as applicable

Assessment

As outlined in section A-14 and as applicable

B:6 Phase- A Year- 2 Block- 6 (PAY2B6)

B:6.1 Advanced Medical Education in Anatomy

Specific objectives

After completing this part of the block the residents should be able to:

Curriculum and its evaluation

W/P Identify an inappropriately written learning objective from a given set of objectives (using a proper understanding of how to formulate learning objectives) that is *supposed* to serve a given purpose of a course / lesson.

A Identify specific parts of some curricula as examples of good and bad curriculum design and explain the reasons (using a proper understanding of curriculum design).

W Identify the specific parts (act, content, condition and criteria) of a given learning objective.

A Select / Write a knowledge-based, skill-based or attitude-based (as applicable) objective for a given topic.

Teaching and its evaluation

A Select / Write appropriate learning objectives (with proper action verbs regarding a knowledge, a skill or an attitude) to match the purpose of a hypothetical learning session.

W/P Identify a 'principle'-oriented and an 'information' oriented text from a given text material, and explain their relative importance in learning and teaching.

W/P Construct one 'principle'-oriented sentence that would represent two or more given 'information'-oriented sentences.

W/P Construct two or more 'information'-oriented sentences as examples of one gives 'principle'-oriented sentence.

W Select an appropriate learning method (large group session / small group session- theoretical or practical) for achieving a given learning objective, and justify the selection.

A Identify the objectives regarding a given topic that can be achieved by the students through self-learning and, thus, do not require 'teaching'.

W/P Identify a topic as appropriate for a given learning method (large group session / small group session- theoretical or practical) from a given collection of topics.

P Identify the 'key words' in a given piece of textual material for preparing a lesson plan.

A Prepare a good lesson plan on a given topic for a given method of teaching (lecture / tutorial / practical), specifically emphasizing the details of how the session will progress.

P Identify the strengths and weaknesses of a given lesson plan.

A Select / mention specific actions for making a given hypothetical large group session more interactive.

A Demonstrate the proper use of a chalk-board / white board in facilitating a large / small group learning session.

A Demonstrate the proper use of a flip chart in facilitating a small group learning session.

W/P Evaluate / judge the importance of the use of a given instruction tool over another for a given topic and a given instructional method, and justify the judgement.

The instruction tool may be one of the following:

living body, dissected cadaver, prosected specimen, diagnostic image, viscus, model, microscope slide, virtual microscopic image, illustration (photograph, realistic & semirealistic drawings, photomicrograph, electron micrograph, schematic diagram or any other type of illustration), multimedia slide (static or animated), video, software (non-interactive or interactive) etc.

P Select an appropriate illustration from several options for teaching a given topic using a given instructional method (lecture / tutorial / practical), and justify the selection.

P Demonstrate the parts of a given specimen, model, skeletal part or figure to an audience (or to the examiners) using a visualiser (or a similar instrument).

A	Select /prepare appropriate questions to be asked during a given hypothetical learning session to assess the progress of learning.
P	Identify the form of a given illustration, mention its specific utility in teaching/learning and judge its essentiality in learning as 'best tool for a particular purpose' / 'complementary to another tool' / 'to be substituted by another tool'.
W/P/A	Identify right and wrong choices of action verbs in given learning objectives that are supposed to serve a given purpose of a hypothetical lesson.
A	Properly facilitate a large group learning session on a given topic for undergraduate / postgraduate students (following updated Medical Education guidelines).
A	Properly facilitate a small group learning session on a given topic for undergraduate / postgraduate student (following updated Medical Education guidelines).
A	Evaluate a learning session judging its specific strengths and weaknesses properly (using a proper understanding of what makes a good large group / small group session).

Instructional material design and its evaluation

P- C	Draw a good flow chart based on a given descriptive text on a paper or on a chalk board / white board, and justify the design.
A- C	Convert a realistic / semirealistic diagram into a schematic diagram.
P- S	Browse the online sources quickly for a mentioned image, select an appropriate one and save it. (keeping sequential record of the browsing).
P- S	Browse the online sources quickly for a mentioned reading material, select an appropriate one and save it as an MS Word file (keeping sequential record of the browsing).
A- C	Type a given piece of English text in MS Word using proper understanding of type size, font, alignment, spacing and colour and page set-up.
P- C	Create an illustration-sheet in MS Word for lamination from a given scanned or downloaded figure (using proper understanding of size, colour contrast, composition and other design principles).
A- C	Laminate a sheet of paper with text or illustration material using a laminator.
P- C	Scan a given illustration into a computer choosing proper resolution and other options, and save it.
A- C	Scan an illustration from a book, do the essential editing in the computer (in black white and in colour) and make a good computer print usable in a small group session.
P- C	Take a good-quality black and white / colour printout of an illustration produce in a computer. (using proper understanding of options in the printer)
P-C	Edit a scanned / downloaded / created illustration using an editing software to produce a good-quality computer-generated printable illustration.
P- C	'Crop' (delete) specific parts of a given text to make them short as suitable for an OHP transparency or a multimedia slide (using or not using bullets)
P- C	Create a good handwritten OHP transparency from a given piece of text (following updated OHP transparency design principles).

A- C	Create a good hand-drawn OHP transparency with a copied or created illustration (following updated OHP transparency design principles).
A- C	Create a photocopied black and white OHP transparency from a given illustration in the computer making necessary modifications inside or outside the computer).
A- C	Create a computer-printed coloured OHP transparency from a given illustration using scanning and editing as required (following updated OHP transparency design principles).
A- C	Prepare OHP transparencies to demonstrate good use of 'masking' (following updated OHP transparency design principles).
A- C	Prepare OHP transparencies to demonstrate good use of 'overlaying' (following updated OHP transparency design principles).
P- C	Place a supplied transparency on an overhead projector appropriately and project it properly on a screen.
P- C	Evaluate the quality of a given OHP transparency judging its strengths and weaknesses.
P- C	Create a good static multimedia slide from a given piece of text together with a given illustration (following the principles of good multimedia slide-making).
P- C	Evaluate the quality a given static multimedia slide judging its strengths and weaknesses (following updated multimedia design principles).
P- C	Create a good animated multimedia slide from a given piece of text together with a given illustration using the principles of good slide-making (following updated multimedia design principles).
P	Evaluate the quality of a given animated multimedia slide judging its strengths and weakness (following updated multimedia design principles).
A- C	Create a good schematic diagram on a given topic on a paper or on a chalk board / white board, and justify the design.
A- C	Design and organise the printing of a synthetic poster / chart / banner on an anatomical topic.
A- C	Prepare a handout relevant to a given learning session and justify the material provided and the way it is provide.
P- C	Prepare an illustration for an OSPE question station by erasing particular labels and adding symbols (A, B, C etc.) to denote them.
A- C	Create a photocopied black and white transparency from an illustration supplied in the computer (making necessary modifications inside or outside the computer).

Presentation and its evaluation

A	Give a good seminar presentation on a medical education topic (following updated guidelines for presentation).
A	Give a good journal club presentation on a medical education topic (following updated guidelines for presentation).
A	Evaluate a seminar / journal club presentation judging its specific strengths and weaknesses properly (using a proper understanding of what makes a good seminar / journal club presentation).

Assessment

W/P	Identify the type of a given question and mention the advantages / disadvantages of the particular type. e.g., different types of MCQ different types of SAQ
W/P	Identify the strengths and weaknesses of mentioned aspects of a given question as an assessment instrument (following appropriate assessment principles).
W/P	Modify a given question to improve its validity / reliability / objectivity / feasibility.
W/P	Identify the level of cognitive domain addressed in a given question .
W/P	Convert a given question assessing a lower level of cognitive domain to that assessing a higher (mentioned) level of cognitive domain.
P	Identify possible questions and their answers that are hidden in a given paragraph.
W	Prepare good essay questions (carrying 10 marks and 25 marks) on a given topic addressing a higher levels of cognitive domain ('analysis' / 'synthesis' for the 10-mark question, and 'synthesis / evaluation / and 'creation' for the 25-mark question) and provide the marks break down as well as a brief assessment checklist. The questions should be able to assess depth of knowledge critical thinking ability and writing skill.
W/P	Allot appropriate marks / time (with the breakdown) to a given question and justify the allotment.
P	Prepare a good SAQ asking for a several-line answer on a given topic addressing a given level of cognitive domain, along with the marks breakdown and answer-checklist (following appropriate question-setting guidelines).
W/P	Prepare a good fill-in-the gap type SAQ on a given topic addressing a given level of cognitive domain along with the answer.
A	Identify the right and wrong choices of action verbs in given questions supposed to assess given aspects of learning and given level of cognitive domain.
W/P	Convert a given essay question to a structured essay question.
P	Prepare a good MCQ of a given format (single best answer / multiple true-false / multiple true-false completion / matching / extended matching / assertion and reason etc.) from a given piece of text.
W/P	Prepare a good SAQ / MCQ question to go with a given clinical / practical scenario to make a good problem-based item.
P	Prepare a good problem-based question from a given set of information on a clinical condition or practical situation.
P	Prepare a good illustration-based question for an OSPE or a written examination using a given illustration.
W/P	Prepare an OSPE question station on a given topic together with a marking / grading checklist (emphasizing practically-oriented knowledge, rather than theoretical knowledge).
A	Prepare an OSPE procedure station for a given skill, together with a marking / grading checklist.
A	Complete a given oral-practical card format (of any MS / MPhil Anatomy paper or of an Anatomy paper of any clinical discipline) appropriately for making it ready for an exam(s).
A	Moderate given questions for making a question paper following specific Moderation guidelines.

** Assessed through Written exams (W), Practical exams (P), assessment of assignment*

Course content

- Curriculum
- Learning and teaching
- Instructional material design
- Assessment

B: 6.2 Optional Subject: Customised Physiology

Specific objectives

(Knowledge)

General physiology

- Name the different fluid compartments in the human body.
- Define diffusion, osmosis, osmolarity, osmolality, tonicity and explain with examples.
- Recognise various forms of intercellular communication and describe ways in which chemical messengers (including second messengers) affect cellular physiology.
- Define homeostasis and explain with examples.
- Explain how proteins contribute to membrane permeability and transport.
- Define and explain resting membrane potential.
- Describe and explain the changes in ionic channels that underlie changes in membrane potential, like action potential.

Cardiovascular system

- Define and explain the following terms: automaticity/ autorhythmicity, functional syncytium, cardiac conduction system, AV nodal delay, electrocardiogram, P wave, QRS complex, T wave, P-R interval, systole, diastole, normal sinus rhythm, bradycardia, tachycardia, stroke volume, end-diastolic volume, end-systolic volume, cardiac output, contractility (force of contraction), blood pressure, total peripheral resistance, hypotension, hypertension and baroreceptor.
- Explain why the SA node acts as the cardiac pacemaker and what the importance of AV nodal delay is.
- Explain why and how the heart works as a functional syncytium.
- Explain the parts of a normal ECG tracing.

- Explain the pathophysiology and ECG changes that occur in first, second and third degree heart blocks and in obvious myocardial infarction.
- Explain the pressure, volume, and flow changes that occur during the cardiac cycle.
- Explain the basis of the arterial pulse and heart sounds.
- State and explain Frank-Starling's Law.
- Describe how sympathetic and parasympathetic inputs affect cardiac output.
- Describe the relationships between blood pressure, cardiac output, stroke volume, heart rate, and total peripheral resistance.
- Explain what is meant by systolic pressure, diastolic pressure, mean pressure and pulse pressure.
- Describe the role of the baroreceptors in maintaining control over blood pressure.
- Describe long and short term control over blood pressure.

Urinary system & body fluids

- Describe the functions of the kidney.
- Define and explain the following terms: diuresis, filtration net filtration pressure, colloidal osmotic pressure, reabsorption, secretion and renal threshold.
- Define glomerular filtration rate, describe how it can be measured, and list the major factors affecting it.
- Outline tubular handling of Na+ and water.
- Discuss tubular reabsorption, and secretion of glucose and K+.
- Discuss the effects of anti-diuretic hormone on water reabsorption at the collecting duct.
- Discuss the effects of aldosterone on sodium reabsorption and potassium secretion at the collecting duct.
- Discuss the control of ADH and aldosterone secretion.
- Describe how the volume of the extracellular fluid is maintained by alterations in renin and aldosterone secretion.
- Describe the basic steps of formation and acidification of urine.
- Explain countercurrent multiplier and countercurrent exchange systems.

Blood& blood coagulation

- Describe the functions of blood.
- Demonstrate an understanding of the functions of the major plasma proteins and mention their normal values.
- Describe the structure, functions and normal values of the red blood cell, white blood cell and platelet.
- Define and explain the following terms: plasma, serum, agglutinogen, agglutinin, Ag-Ab reaction, agglutination, antigenicity, transfusion, transplantation, haemostasis, clot and coagulation.
- Describe the components of blood and their origins.
- Explain the role of haemoglobin in transporting oxygen in red blood cells and outline its fates.

- Delineate the process of haemostasis that restricts blood loss when vessels are damaged.
- Identify the stages of blood clotting and explain the various factors that promote and inhibit blood clotting.
- Explain the genetic basis of blood groups and the reasons for transfusion reactions.
- Explain Landsteiner's law on the basis of ABO and Rh blood groups.
- Explain the mechanism of development of erythroblastosis fetalis.

Respiratory system

- Define and explain the following terms: atmospheric pressure, intra-alveolar or pulmonary pressure, intrapleural pressure, tidal volume, inspiratory reserve volume, expiratory reserve volume, residual volume, inspiratory capacity, functional residual capacity, vital capacity, total lung capacity and dead space.
- Mention normal lung volumes and lung capacities.
- Demonstrate an understanding of how various factors determine alveolar ventilation.
- Discuss the pressure changes that drive the movement of air into and out of the lungs.
- Explain the rhythmic, chemical and neural controls of respiration.
- Explain how oxygen transport is accomplished within the circulatory system.
- Describe the three ways in which carbon dioxide is transported in the blood.
- Mention the specific respiratory functions of the vagus nerves and the respiratory receptors in the carotid body, the aortic body, and the ventral surface of the medulla oblongata.
- Describe the respiratory membrane and explain its functional and clinical significances.

Nervous system (including special senses)

- Define and explain the following terms: membrane potential, resting potential, graded potential, threshold, depolarisation, repolarisation, hyperpolarisation, voltage-gated channel, synapse, pre- and post-synaptic membranes, synaptic delay, ganglia, nuclei, paracrine, autocrine, neurotransmitter, hormone and neurohormone.
- Discuss the differences between the functional organisation of the nervous system and that the endocrine system.
- List neurotransmitters according to their functions.
- Describe the main morphologic features of synapses.
- Distinguish between chemical and electrical transmission at synapses.
- Describe what happens when an action potential arrives at the axon terminal and how neurotransmitter release is triggered.
- Describe how a neurotransmitter is released by pre-synaptic cells, how it moves across the synaptic cleft, and how it interacts with the receptors on the post-synaptic membrane.
- Define and explain IPSPs and EPSPs.
- Describe the components of a reflex arc.
- Describe the muscle spindles and their role in the stretch reflex.
- Describe the Golgi tendon organ and analyse its function as part of a feedback system that maintains muscle force.

- Explain what a motor unit is.
- Classify the sensory receptors and mention their functions.
- Describe the refractive medias.
- Define hypermetropia, myopia, astigmatism and presbyopia, and explain the uses of lenses for their correction.
- Trace the neural pathways that transmit visual information from the rods and cones to the visual cortex.
- Describe and explain the events that occur in an accommodation reflex.
- Describe the pathways of the direct and consensual light reflexes.
- Explain the development of Argyll-Robertson's pupil.
- Divide the basal ganglia functionally and describe the functions the divisions accordingly.
- Discuss the functions of the cerebellum and the neurologic abnormalities produced by diseases of this part of the brain.
- Outline the functions of the autonomic nervous system.
- Describe the composition and correlate functions the enteric nervous system.
- List the temperature-regulating mechanisms, and outline the way in which they are integrated under hypothalamic control to maintain normal body temperature.

Digestive system

- Explain how gastric secretion is regulated during the cephalic, gastric, and intestinal phases of digestion.
- Explain the roles of HCl and pepsin in digestion and explain why the stomach does not normally digest itself.
- Describe the composition and functions of saliva and pancreatic juice.
- Explain how the large intestine absorbs fluid and electrolytes.
- Discuss the nature and action of important gastrointestinal hormones.
- List the major forms of motility in the gastrointestinal tract and outline their roles in digestion and excretion.
- Describe the steps of lipid digestion and absorption, the role of bile acids in solubilising the products of lipolysis, and the consequences of fat malabsorption.
- Describe the formation of bile, its constituents, and its role in the excretion of cholesterol and bilirubin.

Endocrine system

- Define hormone, and state the functions of hormones.
- Name the major endocrine glands, and mention their locations.
- Explain the negative feed back' mechanism of hormonal control with examples.
- Explain the anatomical and functional relationships between the hypothalamus and the pituitary gland.
- Name the hormones produced by the anterior and posterior pituitary.

- Define the effects of the growth hormone in growth and metabolic function, and outline how insulin-like growth factor I (IGF-I) may mediate some of its actions in the periphery.
- Define the chemical nature of the thyroid hormones and how they are synthesised.
- Outline the roles of the thyroid hormones in homeostasis and development.
- List the hormones that affect the plasma glucose concentration and briefly describe the action of each.
- List the consequences of insulin deficiency and explain how each of these abnormalities is produced.
- List the major factors that affect the secretion of insulin.
- List the physiologically significant effects of glucagon and the factors that regulate glucagon secretion.
- Describe the structure of the pancreatic islets and name the hormones secreted by each of the cell types in the islets.
- Mention the three catecholamines secreted by the adrenal medulla with their functions.
- Name three categories of hormones produced by the adrenal cortex, give examples of each, and discuss their actions.
- List and briefly describe the physiologic effects of glucocorticoids.
- List the actions of aldosterone and describe the mechanisms that regulate aldosterone secretion.
- Describe the main features of the diseases caused by excess or deficiency of each of the hormones of the adrenal gland.
- Explain the importance of maintaining homeostasis of bodily calcium and phosphate concentrations, and how this is accomplished.
- Describe the mechanisms of calcium and phosphate absorption and excretion.
- Discuss the functions of the parathyroid hormone.

Reproductive system

- Define and explain the following terms: reproduction, fertilization, gametogenesis, lactation, parturition, puberty, adolescence, thelarche, puberche, menarche and adrenerche.
- Name the key hormones secreted by Leydig cells and Sertoli cells of the testes and by graafian follicles and corpora lutea of the ovaries discuss their functions, describe the effects they have at puberty.
- Outline the roles of chromosomes, hormones, and related factors in sex determination, differentiation and development.
- Summarise the hormonal changes that occur at puberty in males and females.
- Describe the roles of the pituitary and the hypothalamus in the regulation of ovarian function, and the role of feedback loops in this process.
- Describe the hormonal changes that accompany pregnancy and parturition.
- Outline the processes involved in lactation.
- Describe the major events of the ovarian and uterine cycles.

(Skill)

Identify specific aspects/phenomena/mechanism in figures (a list is provided). For example:

- Nerve conduction.
- Cardiac cycle
- Ovarian cycle
- Lung volumes and capacities

Draw and label important flow charts and graphs (a list is provided). For example:

- Draw and label a normal aterine cycle in a female of reproductive age without pregnancy and with pregnancy.
- Draw and label a normal over latory ovarian cycle with pregnancy and with pregnancy.
- Draw and label enteric plexus.
- Draw and label a reflex arc.
- Draw and label the respiratory membrane.
- Draw and label a normal ECG tracing.
- Identify the components of the cardiac conduction system in illustrations and trace the pathway taken by electrical impulses through the conduction system.
- Draw and label the respiratory membrane.

(Attitude)

Demonstrate the basic understanding of structure-function relationship.

Demonstrate the attitude of making proper relationships between anatomico-physiological aspects of the body and clinical phenomena.

Course content

General idea of structure-function relationships in the human being

Customised physiology parts of the following systems an relevant to the professional activities of an anatomist.

- General physiology
- Physiology of the:
- Cardiovascular system
- Urinary system & body fluids
- Blood and blood coagulation
- Respiratory system
- Nervous system (including special senses)
- Digestive system
- Endocrine system

1. Reproductive system

Educational Strategy

As outlined in section A-10 and as applicable

Learning Methods

As outlined in section A-10 and as applicable

Assessment

As outlined in section A-14 and as applicable

C. DETAILS OF THE COURSE: Phase- B

C:1 Basic Aspects of the Phase

Weeks 1 – 15

c. Assignments related to thesis research and a pilot study (if applicable)

d. Submission of research protocol

e. Beginning of thesis research after acceptance by relevant authorities

Submission of research protocol

Before commencing the research work, each research protocol must be approved by the appropriate authorities of BSMMU (Departmental Academic Committee, and Institutional Review Board, if applicable).

Block- 8 (PBB8)

Weeks 16 – 31

Thesis research (contd.) and reporting.

Block- 9 (PBB9)

Weeks 32 – 47

Thesis research (contd.) and reporting.

Week 48 – Week 52

(However, the authority usually allows 12 more weeks to complete the thesis)

a. Thesis presentation (before an audience comprising teachers & residents of the Faculty and, if applicable, those from outside

b. Submission of the thesis

c. Assessment of the thesis, Thesis defence & Comprehensive oral exams.

Guide of the thesis research

The guide of the thesis research must be of the rank of Professor or Associate Professor.

General Objective of the Phase

To orient the residents to various methodologies of research, induce them to get acquainted with them and facilitate fruitful research up to the point proper reporting, which would add to existing body of knowledge in the fields of Anatomy and /or allied disciplines.

Specific Objectives of the Phase

After completing this Phase of the course, the resident will be able to:

- Identify an important research topic in an interesting field
- Identify and phrase a relevant research question or more than one questions
- Conduct useful literature search and write a critical review of literature
- Formulate a research hypothesis or more than one hypotheses (if applicable)
- State the general and specific objectives of the study
- Determine the most suitable study design
- Prepare a study protocol and a study proposal (if applicable)
- Get necessary approvals from the relevant authorities (like an Ethical Committee)
- Conduct the study (collect data)
- Organise and clean the data
- Analyse and interpret the data
- Declare results and draw conclusions
- Demonstrate a proper understanding of how to write a good scientific paper

Basic Guidelines

- A manageable Guide-Resident ratio is maintained all through.
- Research capacities of all the eligible faculty members of the Department are utilized.
- The research is selected in such a way that it is possible to conduct the study within the resources and time available.
- More emphasis is given on methodology rather than on results.
- Ethical issues and considerations are given priority.

C:2 Assignments and Exercises on Thesis

- Reading supplied literature on research and thesis writing.

- Reading the "Contents" pages of a good thesis from the Department to note what is included in a thesis.
- Reading a supplied research paper and noting what is included in its Introduction, Methods (Materials & Methods), Results and Discussion sections.
- Finding specified types of tables in journal articles, interpreting the data in the table, and noting how those data have been used in the text of the Results section.
- Finding specified types of graphs and charts in journal articles, interpreting the data in the graph/chart, and noting how those data have been used in the text of the Results section.
- Selecting one Abstract of an article on each of five (5) specified types of study.
- Doing online (Internet) browsing- especially applying Google Advanced Search and-to find specified text materials.
- Doing online (Internet) browsing- especially applying Google Advanced Image Search to find specified image materials.
- Preparing a Reference list of the selected references from given literature following the specific referencing system used in the Department
- Selecting different forms of referencing from the text of contemporary departmental theses.
- Identifying the research question(s) and objective(s) of a descriptive research article (where these are not given)- by reading it and writing them.
- Identifying the research question(s) hypothesis/hypotheses and objective(s) of an analytical research article (where these are not given)- by reading it and writing them.
- Formulating an Anatomy-related research question, and writing a research hypothesis (if applicable), the null hypothesis (if applicable), one or more objective(s) and a thesis title.
- Selecting an analytical research article where detailed descriptions of the statistical methods have been provided, and studying it.
- Selecting an anatomical research article and giving a detailed description of the materials (human / animal) used in the research. For example- number, species/ethnic group, inclusion criteria, exclusion criteria.
- Entering the supplied data in SPSS.
- Constructing a table to present supplied data usefully.
- Constructing a graph/chart to present supplied data usefully.
- Performing an unpaired / paired 't ' test taking data on the same variable of two groups (from a supplied set of data), and giving the result.
- Performing a Chi-squared test taking two sets of data from two groups (from a supplied set of data), and giving the result.
- Performing an ANOVA test taking the data on the same variable from three groups (from a supplied set of data), and giving the result.
- Performing regression analysis for testing the association between two variables of the supplied data, and giving the result.
- Writing the figure legend of a supplied graph / chart using the information supplied.
- Writing the figure legend of a supplied photograph / photomicrograph using the information supplied.
- Writing a discussion by relating given information from the Results section of an article to the text of two referred articles (so that it reflects the Objectives of the original article).

- Writing a paragraph relating given hypothetical thesis-like sentences to given words/phrases properly.

  For example: Sentence 1: The cases of Kunda et al. (2000) were well-controlled diabetics.

  Sentence 2: About 65% cases of Ahmad's (2005) study had their diabetes well-controlled.

  Phrase 1: It is known; that Phrase 2: In addition; Phrase 3: In contrast

- Translating thesis-like Bangla sentences into English.
- Translating thesis-like English sentences into Bangla- keeping the technical terms in English.
- Converting non-thesis-like sentences into thesis-like sentences following given directions.
- Interpreting the results depicted in a given table and writing it in a language usually used for writing the text of a Result section.
- Interpreting the results depicted in a given graph/chart and writing it in a language usually used for writing the text of a Results section.
- Changing the "voice" (active/passive) of given thesis-type sentences.
- Writing an Abstract of a given article.

C:3 Thesis Assessment, Thesis Defence & Comprehensive Viva Formative

MS Thesis, Thesis Defence & Comprehensive Viva- Assessment Format

1:0 Basic Information		
1:1.0	Name of the student:	
1:2.0	Title of the thesis:	....

			– –	–	±	+	+ +	U	S	G	E	O
2:3.0	**Introduction (continued)** or **Review of Literature-** as applicable											
	2:3.1	Adequate background information required to understand the thesis has been provided.										
	2:3.2	Familiarity with, and comprehensive understanding of, related literature have been shown.										
2:4.0	**Materials and Methods**											
	2:4.1	The study design was appropriate for the research objective(s).										
	2:4.2	The selection and exclusion criteria, method of sample size determination (where essential) and sampling methods for the study materials were appropriate.										
	2:4.3	The selection of variables, data collection instruments and data collection methods were valid, reliable and verifiable.										
	2:4.4	The operational definitions were justifiable and adequate descriptions and referencing of the methods have been provided in the thesis (with appropriate figures) to allow others to reproduce the study.										
	2:4.5	Appropriate statistical methods were used to analyse data where and as applicable.										
	2:4.6	New (or modified) and better data-collection instrument(s) or method(s) were devised.										
2:5.0	**Results**											
	2:5.1	Appropriate types of simple figures have been chosen for presenting data- providing proper marking, magnification, and other details in the legends and avoiding repetition of tabular data.										
	2:5.2	Simple and self-explanatory tables have been used putting related data together and providing adequate explanations in the footnotes.										
	2:5.3	Coherent and understandable text has been used to present interpretations of the data (rather than merely presenting the data).										
	2:5.4	The data are correct and have been interpreted correctly in order to answer the research question(s).										

		U	S	G	E	O
2:10.0	**Abstract** The abstract is concise, coherent and understandable having all the essential information on the context (background), study design, place and time of study, objective(s), materials and methods, results and conclusions(s).					

2:11.0 Other observations / comments (if there is any)

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2:12.0 Overall assessment of the thesis

(Please put the marks in the appropriate column)

Unsatisfactory (Less than 60%)	Sufficient (60% - 69%)	Good (70% - 79%)	Excellent (80% - 89%)	Outstanding (90% or more)

.....
Signature of the examiner

3:0 Thesis Defence & Comprehensive Viva (100 Marks)			−−	−	±	+	++	U	S	G	E	O
3:1.0	**Oral presentation**											
	3:1.1	a) Provided all the main points of the Abstract in a logical sequence.										
		b) Organised the language and presentation in a way that made the main points understandable.										
		c) Provided adequate information yet was concise.										
	3:1.2	Prepared the visual aids as- legible, short, simple, interesting and organised.										
	3:1.3	a) Captured attention / interest.										
		b) Maintained proper volume of the voice.										
		c) Maintained proper rate of delivery.										
		d) Was well articulated .										
		e) Maintained eye-contact with the audience.										
		f) Used visual aids to complement oral presentation (rather than to dictate it).										
		g) Showed enthusiasm.										
3:2.0	**Thesis defence**											
	3:2.1	Demonstrated proper understanding of the 'why's, 'what's, 'when's and 'how's of the study (including the understanding of relevant research methodology and biostatistics).										
	3:2.2	a) Defended the contents logically and firmly.										
		b) Demonstrated an understanding to the strengths and weaknesses of the thesis.										
		c) Showed flexibility to accept logical criticisms and incorporate others' ideas into own decisions.										
	3:2.3	Demonstrated an understanding of the immediate and future implications of the study results.										
3:3.0	**Comprehensive viva** Demonstrated the understanding of the conceptual aspects of:											
		a) Introductory topics and General Anatomy.										
		b) Developmental Anatomy & Genetics.										
		c) Neuroanatomy.										
		d) Cell Biology and Histology.										

3:4.0	**Overall performance in the Thesis Defence and Comprehensive Viva** (please put the marks in the appropriate column)				
	Unsatisfactory (Less than 60%)	Sufficient (60% - 69%)	Good (70% - 79%)	Excellent (80% - 89%)	Outstanding (90% or more)

3:5.0	**Other observations / comments** (if there is any)
	....

.....
Signature of the examiner

4:0 Overall Result of the Examination						
(Please consult the attached "Guidelines for the Assessment of the Acceptability of an MPhilThesis")						
Part of the exam	**Marks allotted**	**Marks obtained** (to be decided by the examination board)				
		Unsatisfactory (Less than 60%)	Sufficient (60% - 69%)	Good (70% - 79%)	Excellent (80% - 89%)	Outstanding (90% or more)
a) Thesis	200					
b) Thesis Defence and Comprehensive Viva	100					
		Signatures of the examiners				

C:4 Guidelines for the Assessment of the Acceptability of an MS Anatomy Thesis

An MPhil Anatomy thesis must be judged **unacceptable** if it requires major revisions in form and / or content before it can meet requisite scholarly standards.

Major revisions are required if,

for example, there is any one or more of the following is noted:

- Faulty conceptualisation
- Inappropriate or faulty use of research methodology
- Misinterpretation or misuse of data
- Neglect of relevant material
- Illogical argument
- Unfounded conclusions
- Seriously flawed writing and presentation
- Failure to engage the scholarly context
- Deliberate plagiarism
- Serious failure to follow the BSMMU guidelines for thesis work

The need for the rewriting of substantial portions of the thesis to make it acceptable cannot be considered as "minor". As a rule of thumb, revisions requiring more than two weeks complete cannot be construed as "minor".

Such a thesis must be graded as unsatisfactory (with less than 60% marks).

.....

An MS Anatomy thesis that requires only minor revisions may be judged **acceptable**.

Minor revisions are required if,

for example, if there is any or more of the following is noted:

- Typographical or grammatical errors
- Errors in calculation, labels for tables or figures, nomenclature bibliographic form or details
- Need for minor clarification or change of content

Such a thesis must be graded as any of the following:

- SUFFICIENT..... (60% - 64% marks)
- GOOD..... (65% - 74% marks)

- EXCELLENT……. (75% - 84% marks)
- OUTSTANDING…… (85% or more marks

D: ANNEXURE

D:1 Study Tips

1. We strongly encourage you to study together and work in groups when preparing for both lecture and lab. Discuss complex topics and quiz each other. Working in a group will allow all involved to better understand the material and help clarify any misconceptions.
2. Make sure you examine and study ALL of the bodies in the gross lab. As you will learn, variation is considerable and structures can look completely different in different bodies.
3. Do NOT try to "cram" for the exams. Lecture exams ask you not only to identify material, but to apply and synthesize your knowledge. Instead, try to study a little bit every day.
4. If you have questions, or aren't doing as well as you'd like, please let your supervisor know. We want you to succeed and we are here to help. However, we do not know if you need help unless you come and speak with us!

D:2 Assignments to be Completed by the Residents

*These are meant for assessing different types of competencies, including practical skills and some theoretical aspects important for a resident preparing for an active professional life as a teacher, a researcher, a consultant and a scholar **.*

For PHASE- A only

Serial no.	Assignment	Minimum no. of assignments (and other instructions)
Assignments related to teaching skills		
1.	Preparation of lesson plans of specific types of lesson (lecture / tutorial / practical)	1 in each Block
2.	Model-making and creative demonstration on anatomical topics	1 in each Year in group
3.	Teaching	1 formal 1-hour teaching session (lecture) in front of a departmental audience in each Phase. (In addition, 2 teaching sessions in each Block under the supervision of different Supervisors- from Phase- A Block- 2 onwards)
Assignments related to assessment skills		
4.	Preparation of broad essay questions	3 in each Block
5.	Preparation of SAQ	6 in each Block
6.	Preparation of MCQ	3 in each Block
7.	Preparation of problem-based questions	2 in each Block
8.	Preparation of Structured Essay Questions (SEQs)	3 in each Block
9.	Preparation of OSPE question station with checklists	5 in each Block

Serial no.	Assignment	Minimum no. of assignments (and other instructions)
10.	Preparation of OSPE procedure stations with checklists	2 in each Block
11.	Preparation of illustration-based questions	2 in each Block
12.	Preparation of oral-practical cards following specified semi-structured formats	3 in each Block
13.	Moderation of questions	1 in each Block
Assignments related to instructional materials		
14.	Preparation of OHP transparencies	1 in each Block
15.	Preparation of static PowerPoint slides	1 in each Block
16.	Preparation of animated PowerPoint slides	1 in each Block
17.	Preparation of handouts	1 in each Block
18.	Preparation of models or other innovative instructional materials	1 in each Block
19.	Drawing & lablelling	2 from each subject of each Block
Assignments related to in-depth understanding of topics		
20.	Essay-writing (by going through relevant literature)	1 for each Block
Assignments related to the dissection hall		
21.	Dissection of cadaver	The region of the body included in each Block by each batch in a team †
22.	Preparation of museum specimens	2 as a whole

Serial no.	Assignment	Minimum no. of assignments (and other instructions)
Assignments related to the laboratories		
23.	Preparation of hen's egg and its observation	1 as a whole
24.	Preparation of chick embryo whole mounts	Of 3 ages (12 hr / 24 hr / 48 hr / 72 hr)
25.	Preparation of chick embryo sections	3 different sections
26.	Preparation of histology slides-with routine stain	2 from each system
27.	Preparation of histology slides-with special stain	2 stains
28.	Preparation of histology slides-ground section of bone	1 as a whole
29.	Micrometry	2 in a relevant Block
30.	Drawing from microscopic slides by using a drawing tube	2 in a relevant Block
31.	Photomicrography	2 in a relevant Block
32.	Use of special tissue preparation procedures	
33.	Use of special microscopic procedures	
34.	Use of other equipments	
35.	Karyotyping	Once in the relevant Block
36.	DNA cloning through PCR	Once in the relevant Block
37.	DNA/RNA electrophoresis	Once in the relevant Block
Assignments related to collection of reading and instruction material		

Serial no.	Assignment	Minimum no. of assignments (and other instructions)
38.	Online browsing & downloading of material, keeping sequential record of the search	2 in each Block
39.	Collection of reading material	2 in each Block
40.	Collection of illustrations that are not available in the department or in common books	5 in each Block

For PHASE- B only

Assignments related to thesis		
1.	Pre-thesis assignments on research	1 complete set
2.	Pre-thesis assignments on thesis-writing	1 complete set
3.	Formal presentation of thesis protocol	(In front of an audience comprising departmental and extra-departmental members)

For Both PHASE- A & B

Assignments related to presentation skills		
1.	Journal Club / other presentation	1 in each Block
2.	Seminar presentation	1 in each Block
Assignments related to extracurricular exposure		
3.	Extracurricular reading, listening, viewing etc.	5 in Phase- A and 2 in Phase- B
4	Extracurricular presentation / discussion	2 in Phase- A and 1 in Phase- B

Serial no.	Assignment	Minimum no. of assignments (and other instructions)
Other assignment		
5.	Use of relevant interactive computer software for learning (depending on the availability)	
6.	Attending outside seminar / symposium / conference	1 in each Block (with reporting on the seminar / symposium / conference)
7.	Maintenance of a portfolio	

***** The assignments are mandatory and will cover the topics of the respective Blocks. Residents should complete each assignment, get it assessed by the Supervisor related to that particular assignment and record it in the Log Book with signature from the Supervisor.

At least 75% of the relevant assignments must be completed before sitting for the corresponding End-Block Exam. Rest may be carried on to the next Block. If any resident fails to do so, s(he) should apply to the Departmental Academic Committees to allow him / her to carry on the assignments to the next Block, stating reasonable justification. The committee would decide on the matter and put their comments on the Log Book.

However, all (100%) of the assignments must be completed before applying for the corresponding summative exams.

† In case of unavailability of cadavers for dissection, thorough exposure to prosected cadavers and specimens must be ensured by the department (with help from other institutions, if required).

D:3 Recommended Reading Materials

1	General Anatomy	Principles of General Anatomy- by A. K. Datta
2	Regional Anatomy	Clinical Anatomy- by R. S. Snell or Clinically-Oriented Anatomy- by K. L. Moore, Arthur F. Dalley, Anne M. R. Agur.
3	Anatomical atlas	Grant's Atlas of Anatomy- by A. M. R. Agur & A. F. Dalley. Colour Atlas of Human Anatomy- by R.M.H. McMinn, & R. T. Hutchings
4	Dissection manual	Cunningham's Manual of Practical Anatomy- edited by G. J. Romanes (volumes 1, 2, 3)
5	Surface Anatomy	Anatomical Basis of Clinical examination- by John S. P. Lumley
6	Diagnostic images (Radiological Anatomy) and	(Images in Snell's, Moore's & supplied images)

	Sectional Anatomy	
7	Preservation of dead bodies & museum techniques	Embalming: Principles & Legal Aspects- by M. L. Ajmani (selected parts) (Supplied materials)
8	Physical Anthropology & Forensic Anatomy	(Supplied materials)
9	Comparative Anatomy	Comparative Anatomy of Vertebrates- by G. Kent (selected parts) (and supplied materials)
10	Developmental Anatomy	Langman's Medical Embryology- edited by T. W. Sadler
11	Chick embryo practical	Embryology of Chick and Pig- by B. M. Harrison An Atlas of Embryology- by W. H. Freeman & B. Bracegirdle (selected parts) A Laboratory Manual of Embryology- selected parts of a book by L. B. Arey
12	Anatomy of reproduction (including assisted reproduction)	(Supplied materials)
13	Genetics & Molecular Biology	Emery's Elements of Medical Genetics- edited by P. D. Turnpenny & S. Ellard
14	Cell Biology & Histology	Junqueira's Basic Histology: Text & Atlas- by Junqueira & Carneiro or Histology: A Text & Atlas- by M. H. Ross & W. Pawlima
15	Histology atlas	Functional Histology: Text & Atlas- by Weater et al. or de Fiore's Atlas of Histology with Functional Correlations- edited by V. P. Eroschenko
16	Histology practical manual	Manual of Histologic and Special Techniques- by M. F. Gridley Theory and Practice of Histological Techniques- by J. D. Bancroft (and supplied materials)
17	Microscopy manual	Theory and Practice of Histological Techniques- by J. D. Bancroft (and supplied materials)
18	Neuroanatomy	Clinical Neuroanatomy- by R. S. Snell
19	Research Methodology & research writing	Essentials of Writing Biomedical Research Papers- by M. Zeiger (and supplied materials)
20	Biostatistics	(Supplied materials)
21	Medical Education	(Supplied materials)
22	Extra-curricular activity	(Supplied materials)

Above is a primary list of reading materials. In addition, many other books are available in the department on each of the above topics. Selected portions of these books are recommended by the teachers while facilitating residents' learning. Handouts and collected materials from online sources are also used. The departmental library also has a rich collection of illustrations and relevant diagnostic images.

রেসিডেন্টদের ছু টি অধ্যাদেশ

১। **নামকরণঃ** এই অধ্যাদেশকে বঙ্গবন্ধু শেখ মু জিব মেডিক্যাল বিশ্ব বিদ্যালয়ের "রেসিডেন্টদের ছু টি অধ্যাদেশ" বলা হবে।

২। **সংজ্ঞাঃ** বিষয় অথবা প্র সঙ্গের পরিপন্থ ী কিছু ই না থাকলে এই অধ্যাদেশে-

(ক) "বিশ্ব বিদ্যালয়" অর্থ বঙ্গবন্ধু শেখ মু জিব মেডিক্যাল বিশ্ব বিদ্যালয়;

(খ) "সিন্ডিকেট" অর্থ বঙ্গবন্ধু শেখ মু জিব মেডিক্যাল বিশ্ব বিদ্যালয়ের সিন্ডিকেট;

(গ) "ভাইস চ্যান্সেলর" অর্থ বঙ্গবন্ধু শেখ মু জিব মেডিক্যাল বিশ্ব বিদ্যালয়ের ভাইস-চ্যান্সেলর;

(ঘ) "প্রে া-ভাইস চ্যান্সেলর" অর্থ বঙ্গবন্ধু শেখ মু জিব মেডিক্যাল বিশ্ব বিদ্যালয়ের প্রে া-ভাইস-চ্যান্সেলর;

(ঙ) "ডীন" অর্থ এই বিশ্ব বিদ্যালয়ের সংশি-ষ্ট অনু ষদের ডীন;

(চ) "কোর্স ডাইরেক্টর" অর্থ এই বিশ্ব বিদ্যালয়ের রেসিডেন্সি প্রে াগ্র ামে বিভিন্ন অনু ষদ কতৃ ৃক মনোনীত কোর্স ডাইরেক্টর;

(ছ) "রেজিস্ট্র ার" অর্থ এই বিশ্ব বিদ্যালয়ের রেজিস্ট্র ার;

(জ) "চেয়ারম্যান" অর্থ এই বিশ্ব বিদ্যালয়ের বিভিন্ন বিভাগের চেয়ারম্যান;

(ঝ) "কোর্স কো-অর্ডি নেটর" অর্থ এই বিশ্ব বিদ্যালয়ের রেসিডেন্সি প্রে াগ্র ামের বিভিন্ন বিভাগের কোর্স কো-অর্ডি নেটর;

(ঞ) "কোর্স সু পারভাইজার" অর্থ এই বিশ্ব বিদ্যালয়ের রেসিডেন্সি প্রে াগ্র ামের বিভিন্ন বিভাগের কোর্স সু পারভাইজার;

(ট) "শিক্ষক/ চিকিৎসক/ কর্ম কর্ত া/কর্ম চারী" অর্থ এই বিশ্ব বিদ্যালয়ের শিক্ষক/ চিকিৎসক/ কর্ম কর্ত া/কর্ম চারী;

(ঠ) "রেসিডেন্ট" অর্থ এই বিশ্ব বিদ্যালয়ের রেসিডেন্সি প্রে াগ্র ামের এমডি/এমএস/এমফিল কোর্সে ভর্তি কৃ ত ছাত্র-ছাত্রী;

(ড) "ব-ক" অর্থ রেসিডেন্সি প্রে াগ্র ামে কর্ম কালীন সময়েকে দু ই থেকে চার মাসের ভিত্তিতে বিভক্তিকৃ ত সময়;

(ঢ) "মূ ল বিভাগ" অর্থ রেসিডেন্টগণ যে বিভাগের অধীনে ভর্তি হয়েছেন;

(ণ) "রেসিডেন্সি প্রে াগ্র াম" অর্থ এই বিশ্ব বিদ্যালয়ের রেসিডেন্সী প্রে াগ্র াম নামে প্র বর্তি ত স্না াতকোত্তর এমডি/এমএস/এমফিল কোর্স সমূ হ;

(ত) "রেসিডেন্সি প্রে াগ্র ামের ফেইজ" অর্থ এই বিশ্ব বিদ্যালয়ের রেসিডেন্সি প্রে াগ্র ামের অন্তর্ভূ ত এমডি/এমএস/এমফিল কোর্স সমূ হের ফেইজ 'এ' ও ফেইজ 'বি';

(থ) "ছু টি অনু মোদনকারী কর্ত ৃপক্ষ" অর্থ এই বিশ্ব বিদ্যালয়ের রেসিডেন্সি প্রে াগ্র ামের অন্তর্ভূ ত রেসিডেন্টদের ছু টি অনু মোদনকারী কর্ত ৃপক্ষ;

৩। **ছু টির নিয়মাবলীর প্রাধান্য ও প্রয়োগঃ**

রেসিডেন্টদের ছু টির ক্ষেত্রে বর্ত মানে বলবৎ অন্য যে কোনো আইন/আদেশ/অধ্যাদেশ ইত্যাদি যা কিছু ই থাকু ক না কেন, ১লা মার্চ / ২০১০ ইং তারিখ হতে ছু টির এই অধ্যাদেশ কার্য কর বলে গণ্য হবে।

৪। **ছু টির প্রকৃ তিঃ**

(ক) নৈমিত্তিক ছু টি, (খ) চিকিৎসা ছু টি, (গ) বিনোদন ছু টি, (ঘ) মাতৃ ত্ব জনিত ছু টি ও (ঙ) বিনা বেতনে/ পারিতোষিকে অসাধারণ ছু টি।

৫। **সাধারণ নিয়মাবলীঃ**

(ক) ছু টি শুধু অধ্যয়নকালীন কর্ত ব্য পালনের মাধ্যমেই অর্জি ত হবে। ছু টি কোনো অধিকার হিসাবে দাবী করা যাবে না;

(খ) জর"রী প্র য়োজনে যে কোনো ছু টি মঞ্জু র করার অথবা যে কোনো মঞ্জু রকৃ ত ছু টি বাতিল করার ক্ষমতা ছু টি অনু মোদনকারী কর্ত ৃপক্ষের উপর ন্যস্ড় থাকবে;

(গ) আবেদনকারীর ছু টির আবেদনপত্রে দায়িত্ব পালনকারীর নাম, পদবী, বিভাগসহ সম্মতির উলে-খ থাকবে হবে;

(ঘ) ছু টির হিসাব মূ ল বিভাগীয় কার্য ালয়ে সংরক্ষণ করতে হবে এবং একই সাথে রেসিডেন্টদেরকে নিজ নিজ লগ বু কে তা এন্ট্রি করতে হবে;

(ঙ) বিনা বেতনে/ পারিতোষিকে অসাধারণ ছু টি এবং মাতৃ ত্ব জনিত ছু টি ভোগের ক্ষেত্রে রেসিডেন্ট ছাত্র/ছাত্রী স্ব াভাবিক পারিতোষিক পাবেন না, পরবর্ত ী পর্য ায়ে কাজে যোগদানের পর দায়িত্ব পালনের মাধ্যমে পু নরায় পারিতোষিক পাওয়ার যোগ্য হবেন;

(চ) কোনো রেসিডেন্ট দু ই সপ্তাহের অধিক ব-ক রোটেশনে অনু পস্থি ত থাকলে ঐ ব-ক রোটেশন অসম্পূ র্ণ হিসাবে গণ্য হবেন। পরবর্ত ী পর্য ায়ে অসম্পন্ন ব-কটির প্র শিক্ষণ শেষ করার পরই উক্ত রেসিডেন্ট পরবর্ত ী Phase Completion পরীক্ষায় অংশগ্র হণের জন্য যোগ্য বলে বিবেচিত হবেন;

(ছ) সরকারী চিকিৎসকদের ক্ষেত্রে সংশি-ষ্ট রেসিডেন্টকে মাতৃ ত্ব কালীন ছু টি, বিনোদন ছু টি ও বিনা বেতনে অসাধারণ ছু টির ক্ষেত্রে এজি অফিসের ছু টি প্র াপ্তির (leave account) ছাড়পত্রসহ আবেদন করতে হবে। মঞ্জু রীকৃ ত ছু টি পরবর্ত ী পর্য ায়ে সমন্ব য় সাধন করতে হবে।

৬। **প্রকৃ তি অনু যায়ী ছু টির নিয়মাবলীঃ**

(ক) **নৈমিত্তিক ছু টিঃ**

রেসিডেন্ট ছাত্র/ছাত্রীকে বছরে ২০ (বিশ) দিন নৈমিত্তিক ছু টি মঞ্জু র করা যাবে। তবে ০৩ (তিন) মাসের ব-ক রোটেশনে নৈমিত্তিক ছু টি সাধারণভাবে একসঙ্গে ৬ (ছয়) কর্ম দিবসের অধিক মঞ্জু র করা যাবে না;

(খ) **চিকিৎসা ছু টিঃ**

প্র তি বছরে সর্বে াচ্চ ১৫ (পনের) কর্ম দিবস চিকিৎসা ছু টি মঞ্জু র করা যাবে। চিকিৎসা ছু টির ক্ষেত্রে মেডিক্যাল সার্টি ফিকেট দাখিল করতে হবে;

(গ) **বিনোদন ছু টিঃ**

বছরে ১ (এক) বার সর্বে াচ্চ ১০ (দশ) দিন একজন রেসিডেন্ট ছাত্র/ছাত্রী বিনোদন ছু টি ভোগ করতে পারবেন। তবে শর্ত থাকে যে, অন্য কোনো ছু টির সাথে এই ছু টি যোগ করা যাবে না। শিক্ষাবর্ষ শুর“র প্র থম মাসের মধ্যে বছরে কোন সময়ে ছু টি ভোগ করবেন তা উলে-খ করে মূ ল বিভাগের কোর্স কো-অর্ডি নেটর, চেয়ারম্যান ও কোর্স ডাইরেক্টর-এর সু পারিশক্রমে অগ্র ীম ছু টির আবেদন দাখিল করতে হবে।

(ঘ) **মাতৃ ত্বজনিত ছু টিঃ**

সন্ড়ান প্র সবের পূ র্বে ও পরে উভয় দিকে মোট ১২০ (একশত বিশ) দিনের মাতৃ ত্ব জনিত ছু টি মঞ্জু র করা যাবে। রেসিডেন্ট ছাত্রীগণ রেসিডেন্সী প্রে াগ্র ামে থাকাকালীন (ফেইজ এ এবং ফেইজ বি) মাত্র একবার মাতৃ ত্ব জনিত ছু টি ভোগ করতে পারবেন। মাতৃ ত্ব জনিত ছু টির আবেদনের সঙ্গে এই বিশ্ব বিদ্যালয়ের নূ ন্যতম আরএস (অবস এন্ড গাইনী) কর্ত ৃক প্র দত্ত মেডিক্যাল সার্টি ফিকেট দাখিল করতে হবে। কোর্স সু পারভাইর, কোর্স কো-অর্ডি নেটর, বিভাগীয় চেয়ারম্যান ও কোর্স ডাইরেক্টর কর্ত ৃক সু পারিশক্রমে অগ্র ীম ছু টির আবেদন দাখিল করতে হবে;

(ঙ) **বিনা বেতনে/ পারিতোষিকে অসাধারণ ছু টিঃ**

রেসিডেন্ট ছাত্র/ছাত্রীর জন্য উলি-খিত ছু টিসমূ হ সেক্ষেত্রে প্র যোজ্য নয় বলে গণ্য হবে সেক্ষেত্রে বিশেষ বিবেচনায় বিনা বেতনে/ পারিতোষিকে অসাধারণ ছু টি মঞ্জু র করা যাবে। এক্ষেত্রে ছু টির আবেদনের সাথে যথাযথ কারণসহ প্র য়োজনীয় কাগজপত্র জমা দিবে হবে। একটি ফেইজে কেবলমাত্র ১ (এক) বার বিনা বেতনে/ পারিতোষিকে অসাধারণ ছু টি মঞ্জু র করা যাবে।

তবে শর্ত থাকে যে, একই সাথে ৯০ (নব্বই) দিনের অধিক বিনা বেতনে/ পারিতোষিকে অসাধারণ ছু টি মঞ্জু র করা যাবে না। বিশ্ব বিদ্যালয়ের রেসিডেন্সী প্রে াগ্র ামে ভর্তি র পর যে সকল রেসিডেন্ট বিসিএস পরীক্ষায় উত্তীর্ণ হবেন/ সরকারী চাকরিতে এডহক ভিত্তিতে নিয়োগপ্র াপ্ত হবেন/ ফাউন্ডেশন ট্রে নিং-এর জন্য মনোনীত হবেন, সে সকল রেসিডেন্টকে প্র যোজ্য ক্ষেত্রে একই সাথে সর্বে াচ্চ ৩ (তিন) বছর বিনা বেতনে/ পারিতোষিকে অসাধারণ ছু টি মঞ্জু র করা যাবে।

শর্ত থাকে যে, রেসিডেন্ট ছাত্র/ছাত্রীকে ছু টি শেষে কোন সেশনে যোগদান করবেন, তা আবেদনে স্পষ্টভাবে উলে-খ করতে হবে। যদি কোন রেসিডেন্ট আবেদনে উলে-খকৃ ত নির্দি ষ্ট সেশনে যোগদান করতে ব্যর্থ হন তাহলে স্ব াভাবিক নিয়মে তার ভর্তি বাতিল বলে গণ্য হবে।

৭। **ছু টি অনু মোদনকারী কত ৃপক্ষঃ**

কর্ম রত বিভাগের কোর্স সু পারভাইজার ও কোর্স কো-অর্ডি নেটর-এর সু পারিশের ভিত্তিতে মূ ল বিভাগের চেয়ারম্যান আবেদনকৃ ত রেসিডেন্টকে অনূ র্ধ্ব ৬ (ছয়) কর্ম দিবসের জন্য নৈমিত্তিক ছু টি মঞ্জু র করতে পারবেন। ৬ (ছয়) কর্ম দিবসের অধিক নৈমিত্তিক ছু টি এবং চিকিৎসা ছু টি সংশি-ষ্ট অনু ষদের ডীন মঞ্জু র করতে পারবেন। মাতৃ ত্ব জনিত ছু টি, বিনোদন ছু টি ও সকল প্র কার বিনা বেতনে/ পারিতোষিকে অসাধারণ ছু টি কর্ম রত বিভাগের কোর্স সু পারভাইজার, কোর্স কো-অর্ডি নেটর, মূ ল বিভাগের চেয়ারম্যান, কোর্স ডাইরেক্টর ও সংশি-ষ্ট অনু ষদের ডীন-এর সু পারিশের ভিত্তিতে প্রে া-ভাইস চ্যান্সেলর (শিক্ষা) মঞ্জু র করবেন।

শর্ত থাকে যে, ৬ (ছয়) কর্ম দিবসের অধিক নৈমিত্তিক ছু টি, চিকিৎসা ছু টি, মাতৃ ত্ব জনিত ছু টি, বিনোদন ছু টি ও বিনা বেতনে/ প্যারিতোষিকে অসাধারণ ছু টি অনু মোদনের পর বিশ্ব বিদ্যালয়ের রেজিস্ট্রে ার অথবা তৎকত ৃক মনোনীত কর্ম কর্ত া দ্বারা অফিস আদেশ জারি হতে হবে।

আরও শর্ত থাকে যে, সরকারী রেসিডেন্ট ছাত্র/ছাত্রীদের মাতৃ ত্ব ছু টি, বিনোদন ছু টি ও বিনোদন ছু টি ও বিনা বেতনে/পারিতোষিকে অসাধারণ ছু টি বিশ্ব বিদ্যালয় কত ৃপক্ষের সু পারিশক্রমে তাদের নিয়োগ কত ৃপক্ষ অনু মোদন করবেন।

ঙ্গবন্ধু শেখ মু জিব মেডিক্যাল বিশ্ববিদ্যালয়

Bangabandhu Sheikh Mujib Medical University

শাহবাগ, ঢাকা-১০০০।

রেসিডেন্টদের জন্য ছু টির আবেদনপত্র

বরাবর

প্রে া-ভাইস চ্যান্সেলর (শিক্ষা)/ ডীন/ চেয়ারম্যান

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বঙ্গবন্ধু শেখ মু জিব মেডিক্যাল বিশ্ব বিদ্যালয়, শাহবাগ, ঢাকা-১০০০।

১। রেসিডেন্টের নাম ঃ .....

২। মূ ল বিভাগ ঃ .....

৩। যে বিভাগে কর্ম রত ঃ .....

৪। ছু টির সময় ঃ .....

৫। ছু টি ভোগের কারণ ঃ .....

৬। ছু টিকালীন ঠিকানা ও টেলিফোন নম্ব র ঃ .....

৭। দায়িত্ব পালনকারীর নাম ঃ .....

পদবী ও বিভাগ ঃ .....

টেলিফোন নম্ব র ঃ .....

৮। ছু টির ধরন

নৈমিত্তিক ছু টি	চিকিৎসা ছু টি	বিশেষাধিকার/ বিশেষ অনু গ্র হ ছু টি (privilege leave)	মাতৃ ত্ব জনিত ছু টি	বিনা বেতনে/ পারিতোষিকে অসাধারণ ছু টি

৯। ছু টি ভোগের পর যোগদানের তারিখ ঃ .....

_____ _____

আবেদনকারীর স্ব াক্ষর দায়িত্ব পালনে সম্মতি প্র দানকারীর স্ব াক্ষর

১০। ছু টির হিসাব ঃ মোট প্র াপ্য ছু টি | | মোট গৃ হীত ছু টি | | অবশিষ্ট ছু টি | |

কোর্স সু পারভাইজার কোর্স কো-অর্ডি নেটর কোর্স ডাইরেক্টর (প্র যোজ্য ক্ষেত্রে) সংশি-ষ্ট অনু ষদের ডীন (প্র যোজ্য ক্ষেত্রে)

ছু টি মঞ্জু রের আদেশঃ ..... তারিখ থেকে ..... তারিখ পর্য ন্ত নৈমিত্তিক ছু টি/ চিকিৎসা ছু টি/ বিশেষাধিকার/ বিশেষ অনু গ্র হ ছু টি (privilege leave)/মাতৃ ত্ব জনিত /বিনা বেতনে/ পারিতোষিকে অসাধারণ ছু টি মঞ্জু র করা হলো।

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ছু টি অনু মোদনকারী কর্তৃ পক্ষের স্ব াক্ষর

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