
**CURRICULUM
FOR
2 YEARS DIPLOMA PROGRAMME
IN
ANAESTHESIOLOGY
(DA)**



2007

**UNIVERSITY OF HEALTH SCIENCES
LAHORE, PAKISTAN**

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FOREWORD

University of Health Sciences (UHS) Lahore was inaugurated by the President of Pakistan on the 3rd of October 2002 with the vision to explicitly address academic and research needs in the field of health sciences and allied disciplines and to uplift their existing level to bring them on a par with the international standards.

The mission of the University is to develop an intellectual nexus to provide excellence and innovation in medical education and research in order to;

- Impart knowledge and skills to health care providers to enhance their competence in providing community oriented and multi-disciplinary patient-centered care
- Train and produce researchers and specialists in basic and clinical medical sciences
- Establish and maintain continuing professional development programmes for the faculty
- Provide trained professionals and scientists/researchers to the field of Electro Medical/Bio-Medical disciplines
- Assure quality in health education and research at all levels

A university is the zenith of knowledge that imparts quality education and awards degrees for extensive educational attainments in various disciplines with attendant advancement for the development of intellectual community. Protection of traditional knowledge, making exploration about it and obtaining deep understanding of modern technology and research techniques are some of the responsibilities of any university.

UHS is running a number of courses in the field of health sciences in Punjab. The list extends from undergraduate level courses up to the doctorate level both in basic, clinical and allied health sciences.

Since its inception, certain vital tasks were taken into serious consideration by UHS, for instance, curricula development and their up-gradation were among the most important ones besides introduction of contemporary educational programmes.

UHS has revised and finalized curricula for undergraduate Medical/Dental Education, B.Sc Nursing, and Allied Health Sciences.

In keeping with its commitment for further improvement in the standard of medical education, UHS has taken an initiative to modify

and improve one year postgraduate diploma courses to 2 years structured training programmes.

I do not believe in selling an old product in a new packing with a fresh label on it, just to do the job. Original products with actual outcomes for the society must be guaranteed. Being the Vice Chancellor of a public sector health university, I believe, it is my duty to remain vigilant and committed to the cause of improvement of the conventional medical and allied health sciences' curricula on regular basis. This will help produce technically sound professionals with advanced knowledge and skills.

Presently, UHS has designed and facilitated curriculum development committees for eleven clinical disciplines namely: DTCD, DPM, DMRT, DOMS, DLO, Dip. Card, DCH, DCP, DGO, DMRD and DA.

This document precisely briefs the details of updated curriculum for Diploma in Anaesthesiology (DA) as prepared by the Experts' Committee.

I am pleased to acknowledge the efforts made by Prof. I. A. Naveed, the Department of Medical Education and the members of the committee for DA consisting of: *Prof. Taif-ul-Islam Gillani (SIMS), Prof. Asghar Ali Randhawa (PMC), Prof. Khalid Bashir (PGMI), and Prof. Salman Waris (NMC)*. The contributions made by them will go a long way in the education and training of doctors in this field.

I hope, the revised course will be able to meet the needs of latest trends in Anaesthesiology and will certainly produce competent mid-level specialists in the field, which is the main objective of this programme.

Prof. M. H. Mubbashar

Hilal-e-Imtiaz, Sitara-e-Imtiaz
MB, FRCP, FCPS Psych, FRC Psych, DPM
Vice Chancellor/ Chief Executive
University of Health Sciences, Lahore

AIMS AND OBJECTIVES OF THE COURSE

AIM

The aim of 2 years diploma programme in Anaesthesiology is to equip medical graduates with relevant professional knowledge, skills and ethical values to enable them to apply their acquired expertise at primary and secondary health care organizations as non-academic consultants.

OBJECTIVES

DA training should enable a student to:

1. Demonstrate comprehensive knowledge of General Medicine, General Surgery, Physiology, Pharmacology, physical properties of gases and working of vast array of anaesthetic equipment
2. Apply national and international guidelines to assess a patient
3. Satisfactorily addresses fears, concerns and expectations of the patients
4. Evaluate patients in the setting of outpatients department, hospital wards, labour room, emergency and operation theatre
5. Order a set of relevant investigations considering availability, diagnostic yield, cost-effectiveness, side effects, and implications for management
6. Take proper informed consent for physical examination and ensure confidentiality and appropriate environment for intimate physical examination
7. Counsel patients and relatives in patient's preferred language in elective and emergency situations in keeping principles of good communication skills, empathy and empowerment of patients
8. Exhibit emotional maturity and stability, integrity, ethical values and professional approach, sense of responsibility in day-to-day professional activities
9. Act as an independent specialist at community level/Tehsil and District Headquarter Hospital
10. Show initiative and become life long self-directed learners tapping on resources including clinical material, faculty, internet and on-line learning programmes and library

SPECIFIC LEARNING OUTCOMES

Following competencies will be expected from a student completing 2 years course in Anaesthesiology:

1. Discuss principles of basic sciences as applied to Anaesthesiology like haemorrhage, blood transfusion, shock, sterilization of instruments, infection, antibiotics, inflammation, repair & healing
2. Able to procure informed consent in accordance with the guideline set by PMDC
3. Well-versed with triad of Anaesthesia i.e, hypnosis, analgesia and muscle relaxation
4. Aware of his/her role as the one who not only ensures provision of ideal operating conditions for surgery, but also intensive care, resuscitation, alleviation of acute and chronic pain and anaesthesia for diagnostic procedures
5. Is able to assess and balance the risks of anaesthesia
6. Is able to ensure that the patient is as fit as possible
7. Is able to decide on the type of anaesthesia and analgesia
8. Communicate effectively with patients about the intended surgical procedure, can rationally explain benefits vs. risk factors involved in both anaesthesia and the anticipated surgery
9. Is able to allay anxiety and pain

NOMENCLATURE AND DURATION

NOMENCLATURE OF THE PROPOSED COURSE:

The name of diploma course should be retained as DA. This name has been recognized and established for the last many decades worldwide. The duration of courses should be two years structured training in a recognized department under an approved supervisor.

Course Title: DA (Diploma in Anaesthesiology)

Training Centres: Departments of Anaesthesia (accredited by UHS) in affiliated institutes of the University of Health Sciences Lahore

Course Duration and Scheme of the Course:

Total Duration 2 years structured training (6 months in Part I and one & a half year in Part II) in a recognized department under the guidance of an approved supervisor

Part I - SIX MONTHS

Theoretical Component

1. Applied Anatomy
2. Applied Physiology
3. Pharmacology
4. General Pathology/ Applied Hematology
5. Physics & Anaesthetic Equipment
6. Monitoring Equipment
7. Biostatistics and research
8. Behavioural sciences
9. Resuscitations & crisis management.
10. Introduction of basic principles in anaesthesia
11. **Practical conduct of Anaesthesia**
 - a. Preoperative assessment
 - b. Clinical examination & recognition of medical diseases
 - c. Premedication
 - d. Induction of anaesthesia
 - e. Airway maintenance
 - f. Monitoring during anaesthesia
 - g. Recovery from anaesthesia

h. Post op problems and care

Part II- YEAR & a HALF

Theoretical Component

1. General surgical conditions and anaesthesia
2. Medical diseases and anaesthesia
3. Obstetrical and gynaecological anaesthesia
4. Neuro-anaesthesia
5. Paediatric anaesthesia
6. Urology anaesthesia
7. Day care anaesthesia
8. Eye & ENT anaesthesia
9. Trauma & orthopaedic anaesthesia
10. Post anaesthesia care and recovery
11. Crisis management
12. Cardiac arrest and resuscitation
13. Regional anaesthesia: Spinal and epidural, Intrathecal, Extremity blocks

14. **Practical conduct of Anaesthesia**
 - a. Preoperative assessment
 - b. Optimization of common medical diseases
 - c. Premedication
 - d. Induction of anaesthesia
 - e. Airway maintenance
 - f. Monitoring during anaesthesia
 - g. Recovery from anaesthesia
 - h. Post op problems and care

PROPOSED ROTATIONS

(The supervisors can schedule these rotations according to their own circumstances)

YEAR I & II

General Surgery	6 months
Orthopaedics and trauma	4 months
Gynae. & Obs.	4 months
Urology	2 months
ENT	2 months
Eye	1 month
ICU & Post anaesthesia care unit	2 month
Neurosurgery	1 month
Paediatrics	1 month
Cardiothoracic	1 month

24 months

ELIGIBILITY CRITERIA FOR ADMISSION

DOCUMENTS REQUIRED FOR THE ADMISSION

1. Completed DA application form
2. Copy of MBBS degree with mark sheets of professional examinations and certificate of number of attempts in professional examinations
3. Copy of PMDC registration certificate
4. Three latest passport size photographs
5. Reference letters from two consultants, with whom the applicant has worked
6. Certificates of completion of required experience

GENERAL REQUIREMENTS

Candidates eligible for admission should have MBBS or equivalent qualification, registered with PMDC and can fulfill one of the following criteria:

- a. One year experience in Anaesthesiology as medical officer/house surgeon
- b. Six months in Medicine/Surgery and six months in allied specialty as medical officer/house officer/ house surgeon

SPECIAL REQUIREMENTS

1. Obtaining pass percentage in the entry test as determined by the UHS
2. Qualifying the interview successfully
3. Having up to the mark credentials, determined by the UHS (no. of attempts in each professional, any gold medals or distinctions, relevant work experience, research experience from a recognized institution, any research article published in a National or an International Journal)

REGISTRATION AND ENROLLMENT

- Total number of students enrolled for the course must not exceed 8 per unit
- UHS Lahore will approve supervisors for diploma courses
- Candidates selected for the courses will be registered with relevant supervisors and enrolled with UHS

RECOGNITION/EQUIVALENCE OF THE DEGREE AND INSTITUTION

After two years training course, candidate should be given status of a mid-level specialist equivalent to any other similar qualification.

Accreditation related issues of the institution:

1. Faculty

Properly qualified teaching staff in accordance with the requirements of Pakistan Medical and Dental Council (**PMDC**)

2. Adequate Space

Including class-rooms (with audiovisual aids), computer lab

3. Library

Departmental library should have latest editions of recommended books for DA, reference books and latest journals (two national and one international)

CONTENT OUTLINE

PART I DA

APPLIED ANATOMY: Relevant to Anaesthesiology.

Nervous System (central and peripheral)

Brain and spinal cord, cranial nerves (in particular 5, 7, 10)

Cerebral Circulation

CSF formation and flow

Vertebral column, spinal and epidural spaces

Dermatomes of body

Nerve supply upper and lower limbs, thorax, abdomen and perineum

Pain Pathways

Autonomic Nervous System

Detailed anatomy of sympathetic and parasympathetic nervous system

Head and Neck

Mouth, pharynx, Great vessels neck and thorax, Thoracic inlet, intercostals spaces, Thyroid gland

Respiratory System

Nose, Larynx, trachea and bronchial tree, lungs, pleura,

Mediastinum, muscles of respiration, diaphragm

Cardiovascular System

Heart, coronary circulation, conduction system, Blood supply of upper and lower limbs and other relevant organ systems of the body.

APPLIED PHYSIOLOGY:

Nervous System

1. Neuromuscular physiology
2. Nervous system: structure and formation of brain and spinal cord, physiology of sensation, neuromuscular transmission, synaptic transmission, cerebrospinal fluid.
3. Autonomic nervous system
4. Pain pathways
5. Stress response

Respiratory System

1. Control of Respiration
2. Mechanics of Respiration
3. Gas Exchange
4. O₂ & CO₂ Transport

5. Acid-Base Balance

Cardio-Vascular System

1. Origin and Conduction of Cardiac Impulse
2. Cardiac Cycle
3. Coronary Circulation
4. Regulation of Blood Pressure
5. Regulation of Cardiac Output
6. Control of Blood Flow through Organs

Haematology

1. Physiology pertinent to anaemias
2. Physiology of Haemostasis & coagulation
3. Blood and Blood Component Therapy
4. Blood & Blood groups

Gastrointestinal System

1. Nausea & vomiting
2. Hepatic physiology

Renal System

1. Body Compartments, Body fluids, electrolytes balance
2. Renal Blood Flow Regulation
3. Glomerular Filtration, Tubular Functions, formation of urine,
4. Renal Control of Acid/Base Balance
5. Renal failure

Maternal and Neonatal Physiology

1. Physiology of Pregnancy
2. Placental Physiology
3. Foetal Physiology of Circulation
4. Neonatal Physiology and APGAR Scoring

Endocrine system

Pituitary, adrenals, thyroid & parathyroid, Insulin secretion

Physiology of Temperature Regulation

PHARMACOLOGY

A) Principles of General Pharmacology

B) Special pharmacology

General Anaesthetics

1. Intravenous induction agents
2. Inhalation agents: Nitrous oxide, halothane, Isoflurane, desflurane, Sevoflurane
3. Local anaesthetics

Sedatives

1. Benzodiazepines
2. Butyrophenones
3. ALPHA Adrenergic Agonists
4. Clonidine, Dexmetatomidine
5. Phenothiazines

Analgesics

Analgesics: Simple analgesics, NSAIDs, Opiates

Muscle Relaxants

Depolarizing & non-depolarizing, reversal agents

Anti-Cholinergics

- a) Atropine
- b) Glycopyrolate

Medical Gases

- c) Oxygen
- d) Nitrous oxide
- e) Operation theatre environment and recovery area humidity
- f) Entonox
- g) Co₂
- h) Medical Air

Inotropes and vasopressors

Beta blockers

Antihypertensive agents, vasodilators

Antiarrhythmic drugs

Diuretics

Insulin and Oral Hypoglycaemics

Antiemetics

Anti-Histaminics

Antacids

Corticosteroids

Diuretics

Crystalloids and colloids

GENERAL PATHOLOGY/ APPLIED HEMATOLOGY

1. General Pathology

Cell Injury and adaptation

Cell Injury

- Reversible and Irreversible Injury
- Fatty change, Pigmentation, Pathologic calcification
- Necrosis and Gangrene

Cellular adaptation

- Atrophy, Hypertrophy,
- Hyperplasia, Metaplasia, Aplasia

Inflammation

- **Acute inflammation** --- Vascular changes, Chemotaxis, Opsonization and Phagocytosis
- Enlist the cellular components and chemical mediators of acute inflammation
- Differentiate between exudates and transudate
- **Chronic inflammation**
- Etiological factors, Granuloma

Cell repair and wound healing

- Regeneration and Repair
- Healing--- steps of wound healing by first and second intention
- Factors affecting healing
- Enlist the complications of wound healing

Haemodynamic disorders

- Define and classify the terms Edema, Haemorrhage, Thrombosis, Embolism, Infarction & Hyperaemia
- Define and classify Shock with causes of each.
- Describe the compensatory mechanisms involved in shock
- Describe the pathogenesis and possible consequences of thrombosis
- Describe the difference between arterial and venous emboli

Neoplasia

- Dysplasia and Neoplasia
- Differences between benign and malignant neoplasms
- Enlist the common etiological factors for neoplasia
- Define and discuss the different modes of metastasis
- TNM staging system and tumor grade

Immunity and Hypersensitivity

Urinary system: Effect of injury and disease

Respiration: disturbance resulting from injury or Disease (Asthma, emphysema, Bronchitis)

2. Applied Hematology

- Blood Transfusion
- Cross matching techniques
- Infections and blood transfusions.
- Blood and Blood Component Therapy
- Complications of blood transfusion

Salient pathophysiological and clinical Features Of:

- Different types of anemias
- Immune hemolytic anemias.
- Clotting and bleeding abnormalities
- Acute / Chronic leukemias

PHYSICS AND EQUIPMENT

1. Basic Definitions

For example Vapour Pressure, Critical Pressure, Critical Temperature, Boiling Point, Thermal Conductivity

2. Basic laws of physics applicable to Anaesthesia

3. Operation theatre environment and recovery area

For instance, humidity, temperature, light, electrical safety, pollution, infection, post-anaesthesia care unit (PACU)

4. Medical gas supply system VIE (Visual Information Engineering), manifolds, cylinders, regulation

5. Anaesthesia machines, machine check, safety feature, flow meters, vaporizers, pressure relief valves

6. Delivery system / Breathing systems

Mapelsons circuits, circle absorber

7. Ventilation

Basic principles of minutes' volume dividers, (Pressure generator, flow generation)

8. Scavenging System

9. Anaesthesia Sundries

Laryngoscopes, guedel airways, face masks, laryngeal mask airways, endotracheal tubes, bougies, stiletts, connectors

10. Monitoring

- a. Standards / Principles of monitoring
- b. Record Keeping
- c. Critical Incident Monitoring
- d. Principles of Oximetry
- e. Principles of Capnography
- f. Electrocardiography

- g. Temperature Monitoring
- h. Neuromuscular Monitoring
- 1. Blood Pressure Monitoring, Non-Invasive and Invasive
- j. Blood Loss
- k. Airways Pressures / Spirometry
- l. Cerebral Function Analysis Monitor

BEHAVIOURAL SCIENCES

- a. Bio-Psycho-Social (BPS) Model of Health Care
- b. Use of Non-medicinal Interventions in Clinical Practice
 - Communication Skills
 - Counselling
 - Informational Skills
- c. Crisis Intervention/Disaster Management
- d. Conflict Resolution
- e. Breaking Bad News
- f. Medical ethics, Professionalism and Doctor-Patient Relationship
 - Hippocratic Oath
 - Four Pillars of Medical Ethics (Autonomy, Beneficence, Non-maleficence and Justice)
 - Informed Consent and Confidentiality
 - Ethical Dilemmas in a Doctor's Life
- g. Delivery of Culturally Relevant care and Cultural Sensitivity
- h. Psychological aspects of health and Disease
 - Psychological Aspect of Health
 - Psychological Aspect of Disease
 - Stress and its management
 - Psychological aspect of Pain
 - Psychological Aspect of Aging

BIOSTATISTICS AND RESEARCH

- a. Introduction to Bio-Statistics
- b. Introduction to Bio- Medical Research
- c. Why research is important?
- d. What research to do?
 - Selecting a Field for Research
 - Drivers for Health Research
 - Participation in National and International Research

- Participation in Pharmaceutical Company Research
 - Where do Research Ideas come from
 - Criteria for a good research topic
- e. Ethics in Health Research
 - f. Writing a Scientific Paper
 - g. Making a Scientific Presentation
 - h. Searching the Literature

PART II DA

CLINICAL ANAESTHESIA

In the 2nd year of DA, knowledge base of general and regional anaesthesia in the following disciplines will be required:

1. General Surgery
2. Obstetrics and Gynaecological Surgery
3. Paediatric Surgery
4. Neuro Surgery
5. Ophthalmic Surgery
6. Ear, Nose and Throat Surgery
7. Urological Surgery
8. Day Care Surgery
9. Basic Principles of Thoracic Anaesthesia
10. Inter-current medical diseases and Anaesthesia
11. Emergency / Trauma / Orthopaedic Surgery
12. Resuscitation
13. Acute post-operative pain
14. Post-anaesthesia care and recovery
15. Intra-thecal Anaesthesia
16. Pre-operative Assessment

METHODS OF INSTRUCTION/COURSE CONDUCTION

As a policy, active participation of students at all levels will be encouraged.

Following teaching modalities will be employed:

1. Lectures
2. Seminar Presentation and Journal Club Presentations
3. Group Discussions
4. Grand Rounds
5. Clinico-pathological conferences
6. SEQ as assignments on the content areas
7. Skill teaching in operating theatres
8. Self study, assignments and use of internet
9. Bedside teaching rounds in ward
10. Long and short case presentations

In addition to the conventional teaching methodologies following interactive strategies will also be introduced to improve both communication and clinical skills in the upcoming mid-level consultants:

1.1. Monthly Student Meetings

Each affiliated medical college approved to conduct training for DA will provide a room for students' meetings/discussions such as

- a. Journal Club Meeting
- b. Core Curriculum Meetings
- c. Skill Development

a. Journal Club Meeting

Two hours per month should be allocated to the presentation and discussion of a recent Journal article related to Anaesthesiology. The article should be critically evaluated and its applicable results should be highlighted, which can be incorporated in clinical practice. Record of all such articles should be maintained in the relevant department of each medical college. Students of different medical colleges may be given an opportunity to share all such interesting articles with each other.

b. Core Curriculum Meetings

All the core topics of DA should be thoroughly discussed during these sessions. The duration of each session should be at least two hours

once a month. It should be chaired by the chief student (elected by the students of the relevant diploma). Each student should be given an opportunity to brainstorm all topics included in the course and to generate new ideas regarding the improvement of the course structure.

c. Skill Development

Two hours twice a month should be assigned for learning and practicing clinical skills.

List of skills to be learnt during these sessions is as follows:

1. Communication skills
2. Interpretation of radiographs, interpretation of ECG, interpretation of ABGs, interpretation of lab investigations
3. Practical skills i.e. use of relevant clinical instruments
4. Presentation skills: Power point, lectures, small group discussions, article presentation etc.
5. Research and scientific writing
6. For acquisition of procedural skills like I/V cannulation, airway management, sub-arachnoid block, caudal block, I/V regional anaesthesia (Bier's Block) opportunities during ward rotations should be availed

1.2 Annual Grand Meeting

Once a year all students for DA should be invited to the annual meeting at UHS Lahore.

One full day will be allocated to this event. All the chief students will present their annual reports. Issues and concerns related to their relevant diploma courses will be discussed. Feedback should be collected and also suggestions should be sought in order to involve students in decision making. The research work and their literary work can be displayed.

In the evening an informal gathering and dinner may be arranged. This will help in creating a sense of belonging and ownership among students and the faculty.

LOG BOOK

The trainees must maintain a log book and get it signed regularly by the supervisor. A complete and duly certified log book should be part of the requirement to sit for the DA examination. Log book should include adequate number of anaesthetic procedures, routine and emergency management of patients, case presentations in CPCs, journal club meetings and literature review.

Proposed Format of Log Book is as follows:

Candidate's Name: _____
Roll No. _____

PROCEDURES:

- I/V cannulation
- Airway management (intubation technique)
- Infiltration
- Nerve blocks
- Femoral nerve block
- Spinal anaesthesia
- Epidural anaesthesia
- Sub-arachnoid block
- I/V regional anaesthesia (Bier's Block)
- Intra-thecal anaesthesia
- Thoracic anaesthesia
- Caudal block
- Resuscitation

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Diagnosis	Procedure Performed	Supervisor's Signature
1					
2					

Emergencies Handled

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Diagnosis	Procedure /Management	Supervisor's Signature
1					
2					

Case Presented

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Case Presented	Supervisor's Signature
1				
2				

Seminar/Journal Club Presentation

Sr.#	Date	Topic	Supervisor's signature
1			
2			

Evaluation Record

(Excellent, Good, Adequate, Inadequate, Poor)

Sr.#	Date	Method of Evaluation (Oral, Practical, Theory)	Rating	Supervisor's Signature
1				
2				

LITERATURE REVIEW

Students will be assigned a clinical problem most commonly encountered in the relevant specialty and will be specifically trained to review literature in the relevant field and write a '**Review of an Article**' comprising of:

- Topic
- Introduction
- Discussion of the reviewed literature
- Conclusion
- References

EXAMINATIONS

Assessment

It will consist of action and professional growth oriented ***student-centered integrated assessment*** with an additional component of ***informal internal assessment, formative assessment*** and measurement-based ***summative assessment***.

Student-Centered Integrated Assessment

It views students as decision-makers in need of information about their own performance. Integrated Assessment is meant to give students responsibility for deciding what to evaluate, as well as how to evaluate it, encourages students to **'own'** the evaluation and to use it as a basis for self-improvement. Therefore, it tends to be growth-oriented, student-controlled, collaborative, dynamic, contextualized, informal, flexible and action-oriented.

In the proposed curriculum, it will be based on:

- Self Assessment by the student
- Peer Assessment
- Informal Internal Assessment by the Faculty

Self Assessment by the Student

Each student will be provided with a pre-designed self-assessment form to evaluate his/her level of comfort and competency in dealing with different relevant clinical situations. It will be the responsibility of the student to correctly identify his/her areas of weakness and to take appropriate measures to address those weaknesses.

Peer Assessment

The students will also be expected to evaluate their peers after the monthly small group meeting. These should be followed by a constructive feedback according to the prescribed guidelines and should be non-judgmental in nature. This will enable students to become good mentors in future.

Informal Internal Assessment by the Faculty

There will be no formal allocation of marks for the component of Internal Assessment so that students are willing to confront their weaknesses rather than hiding them from their instructors.

It will include:

- a. Punctuality
- b. Ward work
- c. Monthly assessment (written tests to indicate particular areas of weaknesses)
- d. Participation in interactive sessions

Formative Assessment

Will help to improve the existing instructional methods and the curriculum in use

Feedback to the faculty by the students:

After every three months students will be providing a written feedback regarding their course components and teaching methods. This will help to identify strengths and weaknesses of the relevant course, faculty members and to ascertain areas for further improvement.

Summative Assessment

It will be carried out at the end of the programme to empirically evaluate **cognitive, psychomotor** and **affective domains** in order to award diplomas for successful completion of courses.

Eligibility to Appear in Final Examination

- Only those candidates will be eligible to take final examination, who have passed Part 1 examination (after 6 months of education) and have completed two years of structured/supervised training programme.
- Only those candidates who have completed their log books and hold certificates of 75% attendance should be allowed to sit for the exam
- Application for the final examination will be submitted with supervisor's recommendation
- Only those candidates who qualify in theory will be called for clinical examination

DA Examination

Part I DA

The examination will be held after completion of 6 months of education.

Topics included in paper 1

- Anatomy (17 MCQ)
- Physiology (25 MCQ)
- Principles of Pharmacology and Therapeutics (25 MCQ)
- General Pathology/ Applied Hematology (10 MCQ)
- Physics and Equipment (13 MCQ)
- Behavioural Sciences (05 MCQ)
- Introduction to Biostatistics and Research (05 MCQ)

Components of the Part 1 examination

MCQ Paper	100	One Best Type
Total Marks	100	Marks

Part II DA

Topics included in paper 1

Clinical Anaesthesia

1. Day Care Surgery
2. Inter-Current Medical Diseases and Anaesthesia
3. Emergency/ Trauma/ Orthopaedic Surgery
4. Resuscitation
5. Acute Post-Operative Pain
6. Post- Anaesthesia Care and Recovery
7. Intra-Thecal Anaesthesia
8. Pre-Op Assessment

Topics included in paper 2

Clinical Anaesthesia

1. General Surgery
2. Obstetrics and Gynaecological Surgery
3. Paediatric Surgery
4. Basic Principles of Thoracic Anaesthesia
5. Neuro Surgery
6. Ophthalmic Surgery
7. ENT Surgery
8. Urological Surgery

Part II Examination

Theory

<u>Paper I</u>	<u>100 Marks</u>	3 Hours
10 SEQs (No Choice)	50 Marks	
50 MCQs	50 Marks	
<u>Paper II</u>	<u>100 Marks</u>	3 Hours
10 SEQs (No Choice)	50 Marks	
50 MCQs	50 Marks	

The candidates who pass in theory papers, will be eligible to appear in the clinical & viva voce.

OSCE **90 Marks**

10 stations each carrying 9 marks of 10 minutes duration; each evaluating performance based assessment with five of them interactive

Clinical **90 Marks**

Four short cases each carrying 15 marks and one long case of 30 marks.

Components of the Part II examination

Theory paper 1	100 marks
Theory paper 2	100 marks
Clinical/Oral	180 marks
Log Book	20 marks
Total Marks	400

A panel of four examiners from Anaesthesia Department (Two internal and two external) will be appointed for practical examination.

Each component of practical examination will be assessed by two examiners awarding marks simultaneously and independently. The final score awarded will be an average score, as agreed by both examiners.

Pass Percentage and other Regulations Regarding Examination

- Criterion referenced assessment principles will be used
- 20 marks for the log book will be included in the OSCE component
- 60 % marks will be a pass score in each component
- Candidates failing in any one component will have to re-sit the entire examination
- A maximum of 5 attempts to sit for the examination will be allowed, to be availed within 3 calendar years of the first attempt
- Re-admission in DA course is not permissible under any circumstances
- Results will be announced according to rules and regulations set by the Examination Branch of the University of Health Sciences Lahore

RECOMMENDED BOOKS

1. Aithenhead A. R., Smith G., Rowbotham D. J. ***Textbook of Anaesthesia***. 5th ed. Churchill Livingstone
2. Morgan G. E., Mikail M. S., Murray M. J. ***Clinical Anaesthesiology***. 4th ed. Lange
3. Yao and Artusio's. ***Anaesthesiology: Problem oriented Patient Management*** 5th ed. Lippincott Williams and Wilking
4. David P. D. and Kenny G. N. C. ***Basic Physics and Measurement in Anaesthesia***. 5th ed. Butterworth Heinmann
5. Rana M. H., Ali S. Mustafa M. ***A Handnook of Behavioural Sciences for Medical and Dental Students***. Lahore: University of Health Science; 2007.
6. Fathalla M. F. and Fathalla M. M. F. ***A Practical Guide for Health Researcher***. Cairo: World Health Organization; 2004.

RECOMMENDED JOURNALS

1. British Journal of Anaesthesiology
2. Anaesthesia (British Journal)
3. Anaesthesia and Analgesia (American Journal)
4. Anaesthesia and Critical Care (British Journal)