

CHETTINAD ACADEMY OF RESEARCH AND EDUCATION

(DEEMED TO BE UNIVERSITY UNDER SECTION 3 OF THE UGC ACT, 1956)



FACULTY OF MEDICINE

M.D. ANAESTHESIOLOGY

REGULATIONS & SYLLABUS

Rajiv Gandhi Salai, Kelambakkam, Chengalpattu Dist. 603 103. India
T +91-44-47411000 Mail: care@chettinadhealthcity.com Web: www.chettinadhealthcity.com

CHETTINAD ACADEMY OF RESEARCH AND EDUCATION
REGULATIONS FOR M.D. & M.S. CLINICAL PROGRAMS

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CHETTINAD ACADEMY OF RESEARCH AND EDUCATION

Regulations for M.D./M.S. Clinical Courses

1. INTRODUCTION:

M.D. / M.S. Clinical course is a three year post graduate program under the Faculty of Medicine for students with an Under Graduate Degree in Medicine. This program is taught course that covers relevant topics and a research project in the area of specialization. This program shall be competence based and learning shall be essentially autonomous and self-directed and supplemented with practical and laboratory work. The curriculum shall have modular approach to learning. The research component is through original exploration and experiments culminating in the research project. This program shall impart advanced theoretical and practical aspects of subjects previously studied in a more general manner at the undergraduate level.

These courses are aimed at imparting higher-level training to qualified under graduate medical students in various branches of M.D./M.S. Clinical subjects and to involve the learning experiments to the needs of community.

In exercise of the powers conferred under sub rule (a) and (g) of Rule 8 (b) of Memorandum of Association and Clause 2.1, Chapter III of Bye-laws of Chettinad Academy of Research and Education, the Academic Council hereby makes the following regulations:

2. SHORT TITLE AND COMMENCEMENT:

These Regulations shall be called the "Regulations for M.D /M.S. Clinical Courses of Chettinad Academy of Research and Education. These regulations shall come into force from the academic year 2012-2013. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

3. GOAL:

The goal of postgraduate medical education shall be to produce competent specialists and/or medical teachers:

- i) who shall recognize the health needs of the community and carry out professional obligations ethically and in keeping with the objectives of the national health policy.
- ii) who shall have mastered most of the competencies, pertaining to the specialty, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- iii) who shall be aware of the contemporary advance and developments in the discipline concerned.
- iv) who shall have acquired a spirit of scientific inquiry and is oriented to the principals of research methodology and epidemiology and
- v) who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

4. AIMS AND OBJECTIVES:

At the end of the Post Graduate training in the discipline concerned the student shall be able to:

- i) Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health section.
- ii) Practice the speciality concerned ethically and in step to the principles of primary health care.
- iii) Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- iv) Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitating, preventive and primitive measures/ strategies.
- v) Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- vi) Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- vii) Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- viii) Demonstrate empathy and human approach towards patients and their families and exhibit interpersonal behavior in accordance with the societal norms and expectations.
- ix) Play the assigned role in the implementation of National Health Programs effectively and responsibly.
- x) Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- xi) Develop skills as a self-directed learner, recognize continuing education needs: select and use appropriate learning resources.
- xii) Demonstrate competence in basic concepts of Research Methodology and epidemiology, and be able to critically analyze relevant published research literature.
- xiii) Develop skills in using educational methods and techniques as applicable to the teaching of Medical/ Nursing students, General Physicians and Paramedical Health Workers.
- xiv) Function as an effective leader of a health team engaged in health care, research or training

5. COMPONENTS OF THE POSTGRADUATE CURRICULUM:

The major components of the Postgraduate curriculum shall be:

- Theoretical knowledge
- Practical and clinical skills
- Writing Thesis/Research articles
- Attitudes including communication skills.
- Training in research methodology, Medical Ethics and Medicolegal aspects.

6. NOMENCLATURE OF POSTGRADUATE COURSES:

The nomenclature of Post Graduate Degree should be as laid down in the Post Graduate Medical Education Regulations prescribed by the Medical Council of India.

7. ELIGIBILITY FOR ADMISSION:

Every student, selected for admission to a post graduate medical course in Chettinad University on acquiring M.B.B.S degree or an equivalent qualification thereto shall have obtained permanent registration with the Medical Council of India, or any of the State Medical Council(s) or shall obtain the same within a period of one month from the date of his/her admission, failing which his/her admission shall stand cancelled.

Provided that in the case of a foreign national, the Medical Council of India may, on payment of the prescribed fee for registration, grant temporary registration, for the duration of the post graduate course limited to the medical college/institution to which the candidate is admitted for the time being exclusively for pursuing post graduate studies.

Provided further the temporary registration to such foreign national shall be subject to the condition that such person is duly registered with appropriate registering authority in his own country wherefrom he has obtained his basic medical qualification and is duly recognized by the corresponding Medical Council or concerned authority.

8. RECOGNITION FEE AND ELIGIBILITY CERTIFICATE:

Candidates who have passed the M.B.B.S Degree Examination other than that conducted by Chettinad Academy of Research and Education shall obtain Eligibility Certificate from this University at the time of admission and also remit recognition fee as prescribed.

9. REGISTRATION:

A candidate admitted to the Post Graduate Course shall register with the University by submitting the prescribed application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution.

10. PERIOD OF TRAINING / DURATION OF THE COURSE:

The duration of certified study and training for the M.D. / M.S. Post Graduate Clinical Courses shall be three completed years including the period of examination.

Provided that in the case of students possessing a recognised two year postgraduate diploma course in the same subject, the period of training, including the period of examination, shall be two years.

11. COMMENCEMENT OF THE COURSE:

The course shall ordinarily commence from 2nd May of the academic year.

12. CUT OFF DATES FOR ADMISSION:

Candidates admitted up to 31st May of the Academic year shall be registered for the same Academic Year but shall be eligible to take up the final examination along with others students admitted prior to their admission. There shall be no admission of students in respect of any academic session beyond 31st May for postgraduate courses under any circumstances. The University shall not register any student admitted beyond the said date.

13. SYLLABUS:

The Syllabus for the course shall be as specified in the annexure to these Regulations.

14. MEDIUM OF INSTRUCTION:

English shall be the medium of instruction for all the subjects of study and for examination.

***15. WORKING DAYS / ATTENDANCE**

All the candidates joining the Post Graduate training program shall work as "Full Time Residents" during the period of training and shall attend not less than 85% (Eighty Five percent) of the imparted training during each academic year including assignments, assessed full time responsibilities and participation in all facets of the educational process as per MCI norms. 85% attendance is compulsory for all the Post Graduate students for every academic year. The Attendance details may be submitted to the Controller of Examinations at the end of every academic year. The student should also be intimated quarterly regarding the lack of attendance.

***16. CONDONATION FOR LACK OF ATTENDANCE:**

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the Vice Chancellor.

Lack of attendance can be condoned up to a maximum of 5% of the minimum attendance required in the following exceptional circumstances:

- (i) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
- (ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- (iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination. Based on the recommendation of the Head of the Institution, the Controller of Examination shall obtain the approval of the Vice Chancellor for admission of the candidate to the University Examination.

***Sl.No.15 & 16 Amended vide XVIII meeting of Academic Council dated 15.04.2014 and to be replaced as detailed below:**

In the existing regulations for M.D. Pre – Para and M.D./M.S. Clinical courses, it has been stipulated that 85% attendance is compulsory for all the Post graduate students for every academic year. This has been modified to 80% attendance in keeping with Statutory Body norms. There shall be no condonation for attendance. The attendance criteria will hence read as follow as in MCI regulations.

"All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80%(Eighty percent) of the imparted training during each academic year including assignments, assessed full time responsibilities and participation in all facets of the educational process."

The Attendance details shall be submitted to the Controller of Examinations at the end of each academic year. The student should also be intimated quarterly regarding the lack of attendance.

16 (a) STIPEND AND GRANT OF LEAVE

The Post Graduate students undergoing Post Graduate Degree / Diploma/Super-Specialty course shall be paid stipend on par with the stipend being paid to the Post Graduate students of State Government Medical Institutions / Central Government Medical Institutions, in the State / Union Territory where the institution is located. Similarly, the matter of grant of leave to Post Graduate students shall be regulated as per the respective State Government rules.

17. MIGRATION / TRANSFER OF CANDIDATES:

Under no circumstances, Migration/transfer of student undergoing any Post Graduate degree course shall be permitted by the University/Authority

18.TRAINING PROGRAM:

The training given with due care to the Post Graduate students in the recognised institutions for the award of various Post Graduate medical degrees / super speciality

degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational program during the period of stay in the institution.

The Post Graduate students of the institutions which are located in various States / Union Territories shall be paid remuneration at par with the remuneration being paid to the Post Graduate students of State Government medical institutions / Central Government Medical Institutions, in the State/Union Territory in which the institution is located. Similar procedure shall be followed in the matter of grant of leave to Post Graduate students.

- (a) Every institution undertaking Post Graduate training programme shall set up an Academic cell or a curriculum committee, under the chairmanship of a senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other department faculty staff and also coordinate and monitor the implementation of these training Programmes.
- (b) The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India inspectors to assess the same at the time of inspection.

During the training for PG Degree Courses to be awarded in clinical disciplines, there shall be proper training in basic medical sciences related to the disciplines concerned; during the training for the degree to be awarded in basic medical sciences, there shall be training in applied aspects of the subject; and there shall be training in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities for autopsies, biopsies, cytopsies, endoscopic and imaging etc. also be made available for training purposes. The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.

Implementation of the training programmes for the award of various Post Graduate Degree course shall include the following:

Basic Medical Sciences

- (i) Lectures, Seminars, Journal Clubs, Group Discussions, Participation in laboratory and experimental work, and involvement in research studies in the concerned speciality and exposure to the applied aspects of the subject relevant to clinical specialities.

Clinical disciplines

- (i) In service training, with the students being given graded responsibility in the management and treatment of patients entrusted to their care; participation in

Seminars, Journal clubs, Group Discussions, Clinical Meetings, Grand rounds, and Clinico - Pathological Conferences; practical training in Diagnosis and medical and Surgical treatment; training in the Basic Medical Sciences, as well as in allied clinical specialities.

The training program shall be on the same pattern as for M.D. / M.S. in clinical disciplines; practical training including advanced Diagnostic, Therapeutic and Laboratory techniques, relevant to the subject of specialization.

The Academic Council in its XV meeting held on 08.05.2013 resolved to approve the following Curriculum Committee's recommendations.

- ❖ The members of Post Graduate Curriculum committee recommended that M.D/M.S. specialty Post Graduates can be posted to other department, so that it may give the Post Graduate an integrated approach.

MD PG Speciality	Departments to which they may be posted
Anaesthesia	Medicine, Obsterics and Gynaec
Dermatology	Medicine, Pulmonology
Pulmonology	Medicine, Cardiology, Cardio thoracic surgery
Obsterics and Gynaec	Medicine, Neonatology, Oncology
Orthopaedics	General Surgery
ENT	General Surgery
Ophthalmology	General Surgery, Medicine

19.MAINTENANCE OF LOG BOOK

- a) Every Post Graduate student shall maintain a record (Log) book containing skills, the candidate has acquired during the training period certified by the various heads of department where the candidate has undergone training including outside the institution.
- b) The students shall maintain a Record Book (Log Book) of the work carried out by them & training program undergone during the period of training including details of procedures carried out independently or assisted by the candidate. The log book will be checked by the faculty members imparting the training.
- c) At the end of the course, the candidate should summarise the contents and get the record (Log) book certified by the Head of the Department.
- d) The record (Log) book should be submitted at the time of practical examination for the scrutiny of the Board of Examiners.

e) It would be the constant endeavour of the faculty to develop desirable attitudes in the PG trainees during the course by personal examples, interaction and group discussion. Constant watch will be maintained during their work in the wards to ensure that this objective is being met. Although there will be no formal evaluation of attitude, some aspects of this domain would be covered during the formative evaluation as noted below for continued internal assessment. Formative evaluation will be carried out over following activities of the P.G. resident.

- i)Ward work
- ii)Case presentation
- iii)P.G.Lecture
- iv)Journal club
- v)General assessment of affective function attitude by medical & paramedical staff;
- vi)Internal Assessment

Candidates can appear for theory examination only after being certified on the basis of Internal assessment.

20.THESIS / DISSERTATION AND EVALUATION

- a) All Candidates admitted to undergo Post Graduate Degree course shall be assigned a topic for dissertation / thesis by the Head of the concerned unit and the title of the topic assigned to the candidates be intimated to the Controller of Examination of the University by the Head of the Department through the Head of the Institution before end of the First year.
- b) The dissertation / thesis shall be a bound volume of minimum 50 pages and not exceeding 75 pages of typed matter (double line spacing and on one side only) excluding certification, acknowledgements, annexure and bibliography.
- c) Four copies of dissertation shall be submitted six months prior to the commencement of the examination on the prescribed date to the controller of examination of the University.
- d) Two copies are to be submitted as an electronic version of the entire dissertation in a standard C.D. format mentioning the details and technicalities used in the C.D. format.
- e) The concerned Professors / Readers are to supervise and to see that the dissertation are done properly utilising the clinical materials of their own department / institution. The students must learn the design and interpretation of research studies, responsible use of informed consent and research methodology and interpretation of data and statistical analysis. They should seek the help of qualified staff members in the conduct of research. They must learn to use library and the computer-based research.

This training will help them to develop skills in planning, designing and conduct of research studies.

- f) All candidates on admission will be allotted one of the department faculties who have fulfilled the requirement to be guides for purposes of guiding Dissertation/thesis. The topic for dissertation shall be finalized and discussed in the departmental faculty meeting and allotted to the individual candidates before the completion of 3 months after admission. The purpose of dissertation is to develop in the candidate the ability to perform an independent study keeping the principles and research methodology in mind. The candidate will therefore work on the prospective problem either within the department or in collaboration with other departments. There will be continuous monitoring of the dissertation work by the guides and co-guide and by the other department staff throughout the course. The candidate will present the progress of the dissertation to the faculty on the completion of 1 ½ years for monitoring and feedback. The completed dissertation should be submitted not later than 6 months before final examination.
- g) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the start of the Clinical/Practical and Oral examination.
- h) The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical. A candidate shall be allowed to appear for Theory and Practical/Clinical examination only after the acceptance of thesis by the examiners. The thesis shall be evaluated under the following heading:
 - 1) Approved
 - 2) Not approved

In all cases the approval shall be given before 3 months of the date of appearing for the examination and this will be essential before the candidate is allowed to appear for the written examination.

21. SCHEDULE OF EXAMINATIONS:

The examination for M.D./ MS, shall be held at the end of 3rd academic year. An academic term shall mean six month's training period."

22. *SCHEME OF EXAMINATIONS:

Post Graduate Examinations shall consist of Dissertation/Thesis, Written Paper (Theory), Practical/Clinical and Viva voce.

The examinations shall be organised on the basis of "Marking system" to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training.

- a. Dissertation/Thesis:** Every candidate shall carry out and submit a Dissertation/Thesis as explained and approval of Dissertation/Thesis shall be a precondition for a candidate to appear for the final year examination.
- b.** A postgraduate student of a postgraduate degree course would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
- c. Theory:** A Written Examination shall consist of four theory papers each of three hours duration. Each paper carries 100 marks (Total 400 marks). Out of these one shall be of Basic Medical Sciences and one shall be of Recent advances. The theory examinations shall be held well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the Clinical/Practical and Oral examination.
- d. Clinical Examination:** Clinical examination for the subjects in Clinical sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.
- e. Oral Examination:** The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

THEORY	
No. of Theory Papers	4
Marks for each Theory Paper	*100
Total marks for Theory Paper	400
Passing Minimum for Theory	200/400
Total Marks for CLINICAL	300
Passing Minimum for Clinical	150/300
Viva voce	100
Passing minimum for Clinical including Viva voce	200/400

(i) if any candidate fails even under one head, he/she has to re-appear for entire examination.

(ii) Theory paper consist of 2 essay questions of 25 marks each (2 X 25 = 50) & 5 short notes of 10 marks each (5 X 10 = 50). Total =100 marks each.

Sl.No.22 (ii) Amended vide XVIII meeting of Academic Council dated 15.04.2014 and to be replaced as detailed below;-

Resolved to approve 2 Essay Questions (2 x 20 marks) and 10 short notes (10 x 6 marks) for all post graduate medical / broad and higher speciality courses which will take effect for the students appearing for first time examination from March 2015 .

Sl.No.22(ii) Amended in XX Academic Council dated 25.03.2015.

Resolved to approve 2 essays (2 x 20 marks) and 6 short notes (6 x 10 marks) for theory paper in all M. D/ M.S. courses by the Academic Council in its XX meeting held on 25.03.2015.

***Resolved to approve that an examinee should obtain minimum 40% marks in each theory paper and not less than 50% marks cumulatively in all the four papers in P.G. degree examination to be cleared as passed which will be implemented prospectively. (Academic Council in its XX meeting held on 25.03.2015).**

23. EXAMINERS:

All the Post Graduate Examiners shall be recognized Post Graduate Teachers holding recognized post graduate qualification in the subject concerned. For all Post Graduate Examinations, the Minimum number of examiners shall be Four, out of which at least two (50%) shall be external examiners who shall be invited from other recognized universities from outside the state / outside university. The remaining two will be internal examiners.

The qualification and teaching experience for appointment of examiner shall be as detailed below and by the guidelines of Medical Council of India issued from time to time.

No person shall be appointed as an internal examiner in any subject unless he/she has three years' experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject'. "An examiner shall ordinarily be appointed for not more than two consecutive terms"

- i. Under exceptional circumstances, examinations may be held with 3 (three) examiners provided two of them are external and Medical Council of India is intimated for the justification of such action prior to publication of result for approval. Under no circumstances, result shall be published in such cases without the approval of Medical Council of India.

24. MAXIMUM NUMBER OF CANDIDATES:

The maximum number of candidates to be examined in clinical/practical and oral on any day shall not exceed eight for M.D./M.S. Clinical Courses.

25. *NUMBER OF EXAMINATIONS:

The University shall conduct not more than two examinations in a year, for any subject, with an interval of not less than 4 and not more than 6 months between the two examinations. The examination shall be conducted in March and September.

***Sl. No.25 Amended in XXI meeting of Academic Council dated 22.07.2015.**

Resolved to approve the commencement of M.D. /M.S. University examination in April (for Regular Batch) and October (for Supplementary Batch).

26. REVALUATION OF ANSWER PAPERS:

There shall be no revaluation of answer papers. However, re-totaling is allowed in the failed subjects with the payment of required fee fixed by the University within 15 days from the date of receipt of statement of marks.

**SYLLABUS FOR M.D. ANESTHESIOLOGY
POSTGRADUATE COURSE**

1.GOALS

To produce a knowledgeable and competent anesthetist who can

- Safely administer anesthesia for all categories of patients from ASA I TO V for any type of elective and emergency surgery.
- Manage critically ill patients in emergency and ICU.
- Efficiently diagnose and treat acute and chronic pain conditions.
- Teach acquired skills to medical and paramedical professionals.
- Be aware of the recent advances in anesthesia, analgesia and critical care.
- Well versed with principles of research methodology

2. OBJECTIVES

To make sure that besides developing into a competent anesthetist, he/ she acquires skills in all fronts – cognitive, affective and psychomotor domain as he/she has to work as member/team leader in various situations inside and outside the operating rooms.

The student should develop attitudes that lead to

- Lifelong learning and updating
- Sympathetic communication with patients and relatives
- Appropriate communication with colleagues

- Become a teacher for undergraduates, technicians, nurses and paramedical staff
- Participate in case discussions and scientific presentations
- Function as a leader in the operating room

At the end of the 3-year course, the candidate should have the knowledge and ability to

1. Plan and conduct anesthesia, recovery and post operative pain relief for elective and emergency surgeries related to all surgical specialties.
2. Carry out basic life support (BLS) and advanced life support (ALS) and train medical staff for BLS and ALS.
3. Manage unconscious patients – airway management and long-term management of unconscious patient.
4. Manage patients admitted to intensive care unit.
5. Manage patients with chronic intractable pain.
6. Be a team leader in mass casualty situations.
7. Acquire relevant knowledge about the latest developments in the specialty.
8. Demonstrate knowledge of ethical and medico legal aspects of anesthesia and critical care.

3. SYLLABUS

FIRST YEAR

1. History of Anesthesia
2. Candidate should be able to demonstrate a good understanding of human anatomy and physiology relevant to the practice of anesthesia.
 - a. Anatomy
 - Upper airway – nose, pharynx, larynx, tracheobronchial segments
 - Diaphragm, muscles of respiration
 - Applied anatomy of orbit, base of skull, vertebral column, spinal cord, meninges, axilla, first rib, intercostal space.
 - b. Physiology
 - Physiology of respiration
 - Mechanics of respiration
 - Ventilation perfusion matching
 - Lung volumes, capacities and changes with age.
 - Lung function tests
 - Heart and autonomic nervous system
 - Maintenance of blood pressure

- Microcirculation
- Applied physiology of hepatobiliary, renal and endocrine system
- Neuromuscular junction
- Thermoregulation
- Blood groups
- Stress response
- Cerebral blood flow and intracranial tension
- c. Pharmacology
 - General pharmacological principles
 - Concepts of pharmacokinetics and pharmacodynamics
 - Uptake and distribution of inhalational anesthetic agents
 - Pharmacology of anesthesia drugs and adjuvants
 - Pharmacology of drugs used for respiratory, cardiovascular and other diseases
 - Pharmacology of drugs acting on autonomic nervous system
 - Drug interactions in anesthesia
- d. Biochemistry relevant to fluid and electrolyte balance, blood transfusion
 - Artificial blood
 - Perioperative fluid therapy
 - Acid base homeostasis in health and diseases
 - Blood & Blood Products
- e. Applied physics and use of equipments in anesthesia
 - Gas laws
 - Medical gases- storage and central pipeline system
 - Flowmeters, vaporizers
 - Scavenging
 - Monitoring in anesthesia with concepts of mandatory monitoring
 - Breathing systems, carbon dioxide absorbers
 - Suction machines
 - Safety in anesthesia machines
 - Hazards in operating rooms
 - Pollution in operating rooms
- f. Theoretical and practical background of commonly used anesthetic techniques of general and regional anesthesia
 - Airway management
 - Subarachnoid and epidural anaesthesia, analgesia

- g. Documentation and medico legal aspects of anesthesia
 - Importance of accurate documentation to be stressed
- h. Cardiopulmonary resuscitation
- i. Neonatal resuscitation
- j. Preoperative assessment and medication – general principles
- k. Introduction to operation theatre, recovery rooms, ICU
- l. Recovery from anaesthesia
- m. Theoretical background on disorders of:
 - Cardiovascular system
 - Respiratory system
 - Hepatobiliary system
 - Renal system
 - Endocrine system
 - Pregnancy
- n. Oxygen therapy

SECOND YEAR

- a. Relevant anatomy of each system including anatomy for regional anaesthesia and nerve blocks
- b. Sterilization and disinfection of equipments
- c. Computers, utility, computer associated learning and data storage. Computerised anaesthesia records
- d. Introduction to research methodology, randomised clinical trials etc., basics of biostatistics
- e. Pharmacology of drugs used in cardiovascular, respiratory, endocrine, renal diseases and CNS disorders
- f. Interpretation of blood gases and other relevant biochemical values, various function tests and basics of measurement techniques, ECG
- g. Principles of monitoring equipment used for assessment of
 - Cardiac function
 - Temperature
 - Respiratory function
 - Intracranial pressure
 - Depth of anesthesia
 - Neuromuscular blockade
- h. Working principles of ventilators

- i. Special anesthetic techniques as relevant to hypotensive anesthesia, anesthesia in extreme climatic conditions and disaster management
- j. Anesthesia for daycare procedures
- k. Anesthetic management in special situations
 - Emergency
 - ENT
 - Ophthalmology
 - Obstetrics and obstetric analgesia
 - Pediatrics, neonatal emergencies
 - Plastic
 - Endoscopy
 - Dental and maxillofacial
 - Geriatrics
 - Radio diagnosis
 - Radio therapeutic procedures
 - Patients with systemic diseases
- l. Medical statistics relevant to data collection, analysis, comparison and estimation of significance
- m. Intensive care
 - Principles of intensive care
 - Prevention of nosocomial infection
 - Mass casualty, triage
 - Transport of the critically ill
 - Airway management and care
 - Ventilation
 - Shock- pathophysiology and management
 - Nutrition
 - Psychological needs of patients and their families
 - Basic and advanced life support
 - Infection, sepsis, MODS, ARDS
 - DVT and pulmonary embolism
 - Respiratory failure
 - Analgesia, anxiolysis and sedation
 - Trauma
 - Poly trauma
 - Near drowning
 - Burns
 - Poisoning
 - Brain death
 - Organ donation
 - Antibiotics and immunotherapy

THIRD YEAR

- a. Anesthesia for patients with severe cardiac, respiratory, renal, hepato biliary disorders posted for unrelated surgeries
- b. Management of patients in shock, renal failure, critically ill and/ or on a ventilator
- c. Chronic pain therapy and therapeutic nerve blocks
- d. Anesthesia for patients with morbid obesity
- e. Principles of anesthetic management of neuro, cardiac, thoracic, vascular, transplantation, burns and plastic surgery
- f. Principles of one lung ventilation

TEACHING PROGRAMME

ORIENTATION

The student will be given orientation to the operation theatres and the subject of anesthesia. The candidate will be assigned thesis guides so as to help them prepare protocols. Introductory lectures will be aimed to familiarize the student with the basics of anesthesia. Students will be guided to search literature for their thesis protocol.

1ST YEAR OBJECTIVES

The first-year resident will be taught expertise in the management of ASA I & II cases. To start with they will observe and gradually become independent in giving general anesthesia and spinal anesthesia to ASA I & II cases for minor and major surgeries under graded supervision.

2ND YEAR OBJECTIVES

The student will be taught to give anesthesia to ASA I, II, III & IV patients.

3RD YEAR OBJECTIVES

The student should be able to plan and administer anesthesia to all patients under graded supervision including patients for cardiac, neurosurgery, pediatric surgery and all major surgeries. The aim at the end is to make them competent, independent and reliable anesthesiologists to handle all kinds of elective and emergency procedures.

TEACHING SESSIONS

In addition to OR teaching, on a weekly basis student will have

- Journal club
- Clinical case presentation and discussion
- Seminar on specific topics
- Central session like clinical society meetings and continuing medical education
- Departmental morbidity and mortality meet, once a month
- Intradepartmental meet regarding thesis work, once a month
- Hospital morbidity and mortality meet, once a month

POSTINGS

The student will compulsorily be posted in all the clinical units and OTs in the department.

- General surgery
- Orthopaedics and trauma

- Gynaecology
- Obstetrics
- ENT
- Eye
- Paediatrics and neonatal
- Urology
- Post anaesthesia care unit
- Cardiothoracic surgery
- Neurosurgery
- Intensive care unit
- Casualty
- Pain clinic
- Pre anaesthetic assessment clinic

In addition, the candidate will be posted for emergency duties.

ASSESSMENT

GENERAL PRINCIPLES

- The assessment is valid, objective and reliable
- It covers cognitive, psychomotor and affective domains

INTERNAL ASSESSMENT

The performance of postgraduate student during the training period should be monitored throughout the course and duly recorded in the log book as evidence of the ability and daily work of the student.

1. Personal attributes
 - Behavior and emotional stability- Dependable, disciplined, dedicated, stable in emergency situations, shows positive approach
 - Motivation and initiative- Takes on responsibility, innovative, enterprising, does not shrink duties or leave any work pending
 - Honesty and integrity- Truthful, admits mistakes, does not cook up information, has ethical conduct, exhibits good moral values, loyal to the institution
 - Interpersonal skills and leadership qualities- Has compassionate attitude towards patients and attendants, gets on well with colleagues and paramedical staff, is respectful to seniors, has good communication skills.
2. Clinical Work
 - Availability
 - Diligence
 - Academic ability
 - Clinical performance
3. Academic Activity

- Performance during presentation at journal club, seminar, case discussion and other academic sessions
- 4. End of Term Theory Examination
- 5. End of Term Practical/ Oral Examination

THEORY EXAMINATION (TOTAL= 400)

PAPER	TITLE	MARKS
Paper I	Basic sciences as applied to Anesthesiology	100
Paper II	Clinical sciences as applied to Anesthesiology	100
Paper III	Principles and practice of Anesthesiology	100
Paper IV	Recent advances in Anesthesiology including intensive care medicine and pain medicine	100

SUGGESTED BOOKS

1. Miller's Anesthesia
2. Barasch Clinical Anesthesia
3. Wylie- A practice of Anesthesia
4. Dorsch & Dorsch- Understanding Anaesthesia equipment
5. Stoelting- Anesthesia and coexisting disease
6. Lee- A synopsis of Anesthesia
7. Recent advances in Anesthesia and Intensive care
8. Paul Marino- The ICU book
9. Nunn's applied respiratory physiology
10. Pharmacology and physiology in Anesthetic practice
11. Anatomy for Anesthetists- Ellis
12. Anesthesia for infants- Smith
13. Gregory- Pediatric Anaesthesia
14. Chestnut- Obstetric anesthesia
15. Clinical Anesthesiology- Edward Morgan
16. Kaplans Cardiac Anesthesia- Joel A. Kaplan
17. Basic physics and measurement in Anesthesia- Paul D.Davis
18. Textbook of medical physiology – A.C Guyton & J.E Hall
19. Review of medical physiology – W.F Ganong
20. Wards Anesthetic Equipment – Andrew J Davey
21. Regional anesthesia- An illustrated procedural guide – Michael F. Mulroy
22. Irwin & Rippes Intensive care medicine vol. I & II – Richard S. Irwin
23. Cottrell & Youngs neuro anesthesia – James W.E Cottrell
24. Bonicas management of pain – Scott M.Fishman
25. Cousins & Bridenbaughs neural blockade in clinical anesthesia pain medicine Michael J.Cousins
26. Anesthesia for obstetrics – Sol M. Shnider
27. Understanding pediatric anesthesia – Rebecca Jacob
28. Manual of pediatric anesthesia – Jerrold Lerman
29. Thoracic anesthesia – Benumof
30. Anesthesia and uncommon disease – Benumof JL
31. Basic and clinical biostatistics- B Dawson

JOURNALS

1. Anesthesia
2. British journal of anesthesia

3. Anesthesiology
4. Anesthesia Analgesia
5. Annals of cardiac anesthesia
6. Journal of anesthesiology clinical pharmacology
7. Indian journal of anesthesia

CLINICAL EXAMINATION - 300 Marks

Long case - 1 (1 x 150) : 150 Marks
Short cases - 2 (2 x 75) : 150 Marks

Total : 300 Marks

VIVA VOCE - 100 Marks

Station 1	Drugs	: 25 Marks
Station 2	Equipments	: 25 Marks
Station 3	Anaesthesia Workstation	: 25 Marks
Station 4	ECG / X-rays/ABG	: 25 Marks

	Total	100 Marks