

CHETTINAD ACADEMY OF RESEARCH AND EDUCATION

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



FACULTY OF MEDICINE

M.D. RADIO DIAGNOSIS

REGULATIONS & SYLLABUS

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**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 who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

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 Programme 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

4. 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.

5. 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 M.D. RADIODIAGNOSIS

GOAL:

The purpose of this course is to standardize radiology training at post graduate level aiming at producing a competent clinical radiologist to understand both conventional and modern imaging applications and apply the same in the given clinical scenario and diagnose appropriately in the shortest possible time.

OBJECTIVE

- At the end of the post graduate training in radiology, the trainee should be a competent clinical radiologist, understanding both normal and abnormal radiological imaging findings.
- The trainee should have sound knowledge in basic fundamentals of radiology. He should be competent in all imaging modalities (diagnostic and Interventional) both theoretically and practically with a thrust on research.
- The trainee should be in a position to setup a modern radiology department and setting standards for radiology equipment and observing strict radiation safety protocols.
- He should also be prepared to set standard for methodology for radiology teaching and assessment protocols.
- He should be capable of understanding image storing, transfer and retrieval standards (PACS).
- He should also be in a position to build a radiology museum of high standards.
- He should also understand and be in a position to conduct clinico- radiological interactions and CME's.

Teaching Program

TEACHING AND LEARNING ACTIVITIES

A candidate pursuing the course should work in the institution as a full time resident.

No candidate should be permitted to run a clinic / laboratory/nursing home while pursuing post graduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every resident shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students to acquire essential knowledge and skills outlined as given below.

Lectures: Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

a) Didactic Lectures:

Recommended for selected common topics for post graduate students of all specialties. Few topics are suggested as examples:

- 1) Bio-statistic.
- 2) Use of library
- 3) Research Methods
- 4) Medical code of conduct and medical ethics
- 5) National health and disease control program.
- 6) Communication skills.
- 7) Initial introductory lectures about the subject etc.

These topics may preferably be taken up in the first few weeks of the 1st year.

b) Integrated Lectures:

These are recommended to be taken by multidisciplinary terms for selected topics, e.g. Jaundice, Diabetes Mellitus, Thyroid etc.

2. Journal Club

Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the logbook relevant details. Further, every candidate must make a presentation from the selected articles in the allotted journals at least four times a year and a total of 12 presentations in three years. The presentations would be evaluated using checklists and would carry weightage for internal assessment. A timetable with names of the students and the moderator should be announced at the beginning of every year.

3. Subject seminar

* Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the logbook relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using checklists and would carry weightage for internal assessment. A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.

***Amended in XX Acad. Meeting dt.25.03.2015 as once in a month.**

4. **Student symposium:** Recommended as an optional multidisciplinary program. The evaluation may be similar to that described for subject seminar.

5. **Mortality & Morbidity Meetings:** Recommended once a month for all post graduate students. Presentation be done on rotation.

6. ***Inter-Departmental Meetings:** Strongly recommended particularly with departments of Surgery, Orthopedics and Medicine at least once a month. These meetings should be attended by postgraduate students and relevant entries must be made in the Logbook.

*** Amended in XX Acad. Meeting dt.25.03.2015 Paediatrics, Pulmonology and Urology departments to be added.**

7. **Teaching skills:** Postgraduate students must teach Undergraduate students (e.g. Medical, Nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by faculty. Record of their participation should be kept in Logbook.

8. **Continuing Medical Education Programme (CME):** At least 2 state / national level CME programmes should be attended by each resident in 3 years.

9. **Conferences:** Attending conferences is a must, participation and presentation of scientific paper should be encouraged.

POSTGRADUATE TEACHING SCHEDULE

DAY	08.30 – 9.30 am	09.30-1.00 pm	01-2.00 pm	02-3.00 pm	03-4.00 pm
MONDAY	Case of the Week	Clinical Posting	Lunch	Clinical Posting	Physics Class
TUESDAY	Interesting case Presentation	Clinical Posting	Lunch	Clinical Posting	Journal Club
WEDNESDAY	Interesting case Presentation	Clinical Posting	Lunch	Clinical Posting	Interdepartmental Meet
THURSDAY	Interesting case Presentation	Clinical Posting	Lunch	Clinical Posting	Interdepartmental Meet

FRIDAY	Interesting case Presentation	Clinical Posting	Lunch	Clinical Posting	Seminar
SATURDAY	Interesting case Presentation	Clinical Posting	Lunch	Clinical Posting	Interdepartmental Meet

DETAILS OF CLINICAL POSTINGS

Total duration: 3 years

FIRST YEAR (12 months)

Applied radiation physics and basic sciences

Conventional Radiology, GIT, GUT 6 Months

Procedures and mammography

Ultrasonography 6 Months

Emergency Radiology

SECOND YEAR (12 Months)

Conventional radiology, GIT, GUT special procedures 2 Months

Mammography and Basic Angiography

General Ultrasonography with Interventions and Doppler 2 Months

CT 3 Months

MRI 3 Months

Nuclear medicine and Oncoradiology 1 Month

Pediatric Radiology 1 Month

THIRD YEAR (12 months)

Neuroradiology (CT & MRI) 4 Months (2+2)

Cardiac Radiology & Echo 1 Month

General Ultrasound with Doppler 2 Months

*Angiography and Interventional Radiology	3 Months
Elective Postings	2 Months

***Amended in XX Acad. Meeting dt.25.03.2015 Angiography and Interventions Radiology duration to be reduced to 1 month from 3 months and General radiology for 2 months shall be added to clinical postings.**

SYLLABUS

1. BASIC SCIENCES RELATED TO RADIO-DIAGNOSIS

- (a) Radiation physics and Radio-Biology.
 - (b) Radiological anatomy of various organ systems
 - (c) Imaging Techniques
 - (d) Radiography
 - (e) Includes all aspects of: Fundamentals of electromagnetic radiation, X-Ray production, characteristic properties of X-Rays, units of radiation, radiation measurement, X-Ray equipment, X-Ray films, intensifying screens, other X-Ray appliances, dark room equipment and procedures, II TV and cine fluorography, tomography.
- Quality assurance.
 - Radiation hazards and principle and methods of radiation protection.
 - Contrast media: Types, chemistry, mechanisms of action, dose schedule, routes of administration, their potential adverse reactions and management.
 - Clinical applications of important isotopes and instrumentation in Nuclear medicine with advances in both.
 - Physics and applications of advanced imaging i.e., Ultrasound, CT, MRI, Angiography (DSA), PET etc.
- * Practical experiments in physics: A list of experiments is available in the department which a resident should be able to do and interpret the results.

***Deleted in XX Acad. Meeting dt.25.03.2015**

2. RESPIRATORY SYSTEM

Goal

At the completion of the course the resident should be able to interpret conventional and advanced (CT, MRI) chest examinations, differentiating normal from abnormal cases and be able to recognize specific imaging pattern of different diseases.

Content Coverage

Diseases of the chest wall, diaphragm, pleura and airways; pulmonary infections; pulmonary vasculature; pulmonary neoplasms; diffuse lung disease; mediastinal disease; chest trauma; post-operative lung and X-Rays in intensive care.

Essential Objectives

1. Should be able to localize the chest pathology into one of the following compartments: pulmonary, pleural, mediastinal, extra-pleural, extra-thoracic, diaphragmatic, infra diaphragmatic.
2. Recognize chest pathology that requires urgent or emergency treatment and describe this in an adequate manner: Pneumothorax, traumatic aortic rupture, esophageal rupture, acute pulmonary embolism, CHF and tracheo-bronchial foreign bodies.
3. Recognize acute and chronic patterns of bacterial and viral pneumonia's, occupational diseases, allergic states.
4. Recognize acute and chronic cardiac failure patterns and non-cardiogenic edemas.
5. Understand the radiographic features and precipitating causes of adult and infant respiratory distress syndrome.
6. Recognize and describe appropriately the various manifestations of benign and malignant neoplasms of the lung.

Evaluation

Resident's progress through daily observation of work at the end of the rotation an assessment by a small group of faculty.

Maintain a log book showing techniques learnt during the rotation – to be supervised.

3. GASTROINTESTINAL (GIT) AND HEPATO-BILIARY-PANCREATIC SYSTEM

Goal

At the completion of this course the resident should be able to interpret both the conventional and other newer (ultrasound, CT, MRI, angiography) examinations. This includes examination

of GIT i.e., esophagus, upper gastrointestinal study, follow through for small bowel (including small bowel enteroclysis) and enema (both conventional and double contrast) for colon. It also includes examination of liver, biliary system and pancreas using all the imaging modalities available to a radiologist including specialized investigations like ERCP, PTC and interventional procedures like abscess drainage, Percutaneous Transhepatic biliary drainage (PTBD, internal and external), tumor embolization, Radiofrequency (RF) ablation etc.

During this posting resident also performs other investigations done using fluoroscopic guidance e.g; hysterosalpingography (HSG); fistulogram, sinogram, T-Tube cholangiography, sialography etc. and he/she should be able to perform and interpret studies using these modalities.

Content Coverage

Diseases and disorders of mouth, pharynx, salivary glands, esophagus, stomach, small intestine, large intestine, diseases of omentum, peritoneum and mesentery, acute abdomen, abdominal trauma using conventional and newer imaging methods like CT, MRI, DSA, isotope studies.

Diseases and disorders of hepato-biliary-pancreatic system using conventional & newer imaging methods.

Essential Objectives

1. Learn to evaluate the clinical condition & needs of a patient and to decide the appropriate studies and approach for examining the GIT or hepato-biliary-pancreatic system of a patient.
2. Learn a proper approach to fluoroscopy: this includes developing proficiency in GIT fluoroscopy, mastering the equipment and using proper radiation protection measures (both for the patient and the operator).
3. Learn the basic pathology and patho-physiology of GIT/hepato-biliary-pancreatic diseases.
4. Learn to communicate the findings both at fluoroscopy and in films, in an accurate, succinct and meaningful way.

Evaluation:

Day to day observation of resident's work including documentation and interpretation Assessment by a group of faculty at the end of the rotation.

Log book will be maintained of the procedures learnt.

4. GENITO-URINARY SYSTEM

Goal

At the completion of this course resident should be able to perform, direct the radiography and interpret the conventional radiological examinations of the urinary tract. These includes: excretory urography (intravenous pyelography); cystograms, micturating cystourethrography (MCU) and retrograde urethrography (RGU).

[HSG is included under GIT rotation].

In addition, the resident should be able to perform and interpret other diagnostic imaging modalities and procedures which are used to evaluate urinary tract pathology i.e., ultrasound, CT, MRI, angiography, as well as various interventional procedures like percutaneous nephrostomy, kidney biopsy, stent placement, ante grade pyelography, tumor embolization etc.

Obstetrics and gynaecology ultrasound: separate posting in III year.

Hysterosalpingography: already included with GIT posting.

Content Coverage

Imaging: conventional, ultrasound, CT, MRI, angiography; of various diseases and disorders of genitourinary system. These includes: congenital, inflammatory, traumatic, neoplastic, calculus and

miscellaneous conditions.

Essential Objectives

1. Recognize and evaluate emergency conditions involving the urinary tract including trauma, infection, vascular compromise and obstruction.
2. Recognize and understand the patho-physiology of stone disease.
3. Recognize patterns of infectious diseases and the modalities necessary for diagnostic evaluation.
4. Understand the complete evaluation of renal mass lesions and the evaluation of other urinary tract neoplasms, including the detection and staging of the tumor.
5. Recognize the difference between the pattern of diseases affecting the genito-urinary tract of adults and that of children and understand and identify the common conditions affecting the paediatric genito-urinary system on imaging.

Evaluation:

Day to day, based on daily work assessment by a group of faculty at the end of the posting.

Maintain a log book.

5. MUSCULOSKELETAL SYSTEM

Goal

At the end of the course the resident should be able to correctly interpret all the common abnormalities of the bones and joints. He/She should have a good understanding of the common congenital abnormalities, arthritis, bone and joint trauma, neoplastic conditions, metabolic bone disease and inflammatory diseases.

He / She should also have an understanding of the role of CT/MRI in all these conditions and should be able to perform and interpret CT/MRI in diseases of musculo-skeletal system.

Content Coverage

Imaging (Conventional, ultrasound, CT, MRI, angiography, Radio-isotope studies) and interpretation of diseases of muscles, soft tissue, bones and joints including congenital, inflammatory, traumatic, neoplastic and miscellaneous conditions.

Essential Objectives

1. Communicate precisely and cogently radiographic descriptions of bone and joint trauma.
2. Differentiate various forms of arthritis and know correlative laboratory and clinical findings.
3. Enumerate the radiographic features that differentiate benign and malignant bone tumors with a basic familiarity of more common tumors.
4. Know radiographic features of acute and chronic osteomyelitis and discitis (including tuberculosis).
5. Recognize differential features of osteoporosis (including Bone Mineral Density or BMD assessment techniques e.g; US,CT,Dexa) including various endocrine and metabolic diseases e.g; osteomalacia, hyperparathyroidism etc.
6. Know the application and interpretation of ultrasound/CT/MRI/angiography in one or more of the above situations.

Evaluation

Through daily sessions assessment by a small group of faculty at the end of the posting will maintain a log book

6. CARDIOVASCULAR RADIOLOGY/ECHO CARDIOGRAPHY

Goal

Goal is to provide experience in the role of imaging in cardiovascular diseases by different techniques including cardiac catheterization and cardiac angiography, Digital subtraction angiography (DSA) and interventional procedures in non-cardiac arterial and venous diseases.

Content Coverage

Diseases and disorders of cardiovascular system including congenital conditions and the role of imaging by conventional, ultrasound, Echo, color-Doppler, CT, MRI, angiography (including DSA) and radionuclide studies. It also includes interventional procedures e.g; balloon angioplasty, embolization etc.

Essential Objective

1. Understand the anatomy and common pathology of congenital and acquired cardiac conditions.
2. Correlate plain film findings of common congenital abnormalities with those shown by angiography and explain the pathophysiology including abnormal pressure measurements.
3. Correlate plain film findings and the echocardiographic studies of patients with acquired valvular diseases and other common pathological conditions including pericardial pathology.
4. Understand the role of newer modalities like CT/MRI, in aortic diseases e.g., aorto- arteritis, aortic dissection and aortic aneurysm.
5. Should be able to perform fluoroscopy on patients before and after valve replacement and identify those with complications after valve replacement.
6. Understand the principle and logic behind various interventional procedures carried out in the cardiovascular labs e.g; PTCA, balloon dilatation of valvular lesions, septostomy etc.

Evaluation

Day to day assessment by a small group of faculty

Maintain a log book to be checked by faculty in charge.

7. NEURORADIOLOGY

Goal

At the end of the course the resident should be able to demonstrate reasonable proficiency in the assistance during performance as well as in the interpretation of all neuro-radiological

studies. This includes angiograms, both cerebral and non-cerebral studies, transluminal angioplasties, embolization procedures and myelography. They should also be able to perform and interpret CT and MRI of head and spine.

Content Coverage

Includes imaging (using conventional and newer methods) and interpretation of various diseases and disorders of the head, neck and spine covering congenital lesions, infective lesions, vascular lesions, traumatic conditions and neoplasia. It also includes a number of interventional procedures carried out in the department.

Essential Objectives

1. Know detailed normal neuro-imaging anatomy on different imaging modalities.
2. Identify pathologic conditions (listed under the content) on images acquired using different techniques and communicate the report in a concise manner.
3. Participate in daily neuroradiology conferences held with the neurosurgery or neurology units.

Evaluation

Day to day based on reporting and procedures performed.

By a small group of faculty.

Will maintain a log book to be checked by faculty in neuroradiology.

8. GENERAL RADIOLOGY

Goal

In this rotation the resident learns to evaluate conventional radiographs. This includes radiographs of: chest, abdomen, pelvis, skull, spine, musculo-skeleton and soft tissues. Resident is posted in OPD and indoor radiography rooms for this purpose.

During indoor posting, he/she will also have the additional responsibility of directing, evaluating and reporting mammographic procedures including related interventional procedures.

Essential objectives

1. Learns to direct and perform radiography on patients.
2. He/she should be able to decide on further imaging views based on the clinical suspicion and the initial imaging.
3. Write reports on the radiographs obtained in a methodical, concise and precise way and communicate it to the referring unit.

4. Present interesting cases in the departmental meets.

9. ULTRASOUND (INCLUDING GYNAE/OBSTETRICS)

Goal

At the completion of this rotation the resident should be able to perform and interpret all ultrasound studies. These studies include: abdomen, pelvis, small parts, neonatal head, color-duplex imaging (including peripheral i.e; extremity arterial and venous studies), obstetrics/gynaecology (in the department of Gyn/Obstetric) and interventional procedures using ultrasound guidance. The resident should have a thorough knowledge of the common abnormalities of the abdominal/pelvic organs, retroperitoneal structures, neck, chest, extremities and small parts (thyroid/ parathyroid, scrotum, orbit and breast).

Essential Objectives

1. Determine or select the appropriate diagnostic procedure for the clinical problem.
2. Demonstrate proficiency in patient scanning using appropriate techniques and instrumentation.
3. Modify the procedure, if required, based upon the observed abnormalities (pathology).
4. Analyze the results of the diagnostic procedure, make diagnosis and record the findings.
5. Communicate findings, diagnosis and other relevant information to the referring physician.
6. Present interesting ultrasound cases in the departmental conferences/meetings.

Evaluation

Ongoing basis using day to day work presentations in departmental meets maintain a log book by a group of faculty at end of the rotation

10. CT

Goal/Objectives

The goals/objectives to be achieved by the end of this rotation are:

1. Select CT protocol according to the clinical diagnosis. He/she should be able to direct and modify (if required) the performance of the CT examination
2. Demonstrate knowledge of the CT findings of the common pathologic conditions occurring in the head, neck, chest, abdomen, pelvis, and in the soft tissues and musculo-skeletal system.
3. Resident should be familiar with both the conventional and different modified CT techniques (High resolution, Dual phase, CT angio, BMD, multislice CT etc.)

4. Interpret conventional and modified body CT examinations (including HRCT, dual/triple phase CT, CT portography, virtual CT etc.) with a reasonable degree of accuracy.
5. Demonstrate proficiency in verbal and written reporting of CT findings and differential diagnosis.
6. Demonstrate knowledge of the limitations (and potential fallacies) of CT imaging of various pathologic conditions and be able to perform correlations with other imaging modalities including formulations of recommendations for additional appropriate imaging procedures.
7. Perform CT guided biopsy procedures under guidance of seniors.
8. Present interesting cases of CT in the departmental meetings.

Essential Objectives

1. The resident will review the daily body CT schedule and based upon the known clinical information and review of other radiologic studies of the same patient done earlier, select the most appropriate CT imaging protocol for each patient. This may include altering an existing CT protocol to provide the most appropriate examination for an individual patient.
2. Develop a working knowledge of the actual performance of the CT examinations. This includes starting intravenous lines, amount and timing of injecting i.v. contrast, and actual operation of CT machine.
3. Review and report all the completed body CT examinations. Initially this will be under the supervision of the seniors but later independently – but all reports will be signed by the faculty incharge.
4. Participate and present CT cases in departmental and inter departmental meets.

Evaluation

On daily basis after observing reporting and working in the CT room

by a group of faculty. Maintain a log book under the supervision of faculty incharge.

11. MRI

Goal/Objectives

The goals/objectives to be achieved by the end of this rotation are:

1. Select MRI protocol according to the clinical diagnosis. He/she should be able to direct and modify (if required) the performance of the MRI examination
2. Demonstrate knowledge of the MRI findings of the common pathologic conditions occurring in the head, neck, chest, abdomen, pelvis, and in the soft tissues and musculo-skeletal system.

3. Interpret plain and modified body MRI examinations with a reasonable degree of accuracy.
4. Demonstrate proficiency in verbal and written reporting of MRI findings and differential diagnosis.
5. Demonstrate knowledge of the limitations (and potential fallacies) of MRI imaging of various pathologic conditions and be able to perform correlations with other imaging modalities including formulations of recommendations for additional appropriate imaging procedures.
6. Present interesting cases of MRI in the departmental meetings.

Essential Objectives

1. The resident will review the daily body MRI schedule and based upon the known clinical information and review of other radiologic studies of the same patient done earlier, select the most appropriate MRI imaging protocol for each patient. This may include altering an existing MRI protocol to provide the most appropriate examination for an individual patient.
2. Develop a working knowledge of the actual performance of the MRI examinations. This includes starting intravenous lines, amount and timing of injecting i.v. contrast, and actual operation of MRI machine.
3. Review and report all the completed body MRI examinations. Initially this will be under the supervision of the seniors but later independently – but all reports will be signed by the faculty in charge.
4. Participate and present MRI cases in departmental and inter departmental meets.

Evaluation

On daily basis after observing reporting and working in the MRI room by a group of faculty. Maintain a log book under the supervision of faculty in charge.

12. ANGIOGRAPHY AND INTERVENTIONAL RADIOLOGY

Goal

At the completion, the resident should be able to perform the most common non-cerebral angiographic studies. He/she should have a good basic understanding of both; the vascular interventional radiologic procedures such as angioplasty, embolization using various embolizing agents; as well as the various non-vascular interventional procedures such as percutaneous nephrostomy, stenting, abscess drainage, PTC/PTBD, percutaneous biopsy, balloon dilatation of the esophagus etc. He/she should have a good understanding of the various equipment and available catheters and guidewires and other technical aspects of special procedures. In addition, he/she should know all the potential risks and complications of these procedures and their management.

Essential Objectives

1. Evaluate the requisition for appropriate clinical information to determine if additional information is needed.
2. Determine or select appropriate diagnostic procedure for the clinical problem.
3. Assist and perform appropriate procedures under supervision and modify procedures based on observed abnormalities (pathology).
4. Know the potential risks and complications of procedures performed.
5. Know normal vascular anatomy applicable to angiographic procedures performed and know normal anatomy and landmarks to perform other non-vascular procedures.
6. Present interesting cases in the departmental meets.

Evaluation

Day to day evaluation by a group of faculty

Will maintain a log book.

13. PAEDIATRIC RADIOLOGY

Goal

Intention is to train residents to perform common radiologic procedures and to be able to interpret paediatric studies in order that they can appropriately deal with examinations of children in a non paediatric hospital environment.

At the completion the resident should be able to interpret most of the conventional and newer paediatric examinations which includes: upper airways, chest, genito-urinary, gastrointestinal and musculo-skeletal systems. Resident should be familiar with many of the neurologic conditions encountered in neonates and children. Resident should also be able to perform transfontanelle cranial ultrasound.

Content Coverage:

Common diseases and disorders of different organ systems covering congenital, inflammatory, traumatic, neoplastic and other miscellaneous conditions, using both conventional and newer imaging methods.

Essential Objectives

1. Understand the appropriate indications for various imaging procedures and determine that the patient has been properly prepared for the procedure.
2. Know the standard radiographic views for paediatric examinations.

3. Learn to recognize and evaluate imaging manifestations (on conventional and newer methods) of common paediatric conditions occurring in the head/neck, chest, abdomen/pelvis and in the musculoskeleton.
4. Perform paediatric fluoroscopic examinations with skill and accuracy.
5. Understand and apply the knowledge and principle of radiation protection, both for the child and the operator.

14. RADIOLOGY IN EMERGENCY MEDICINE

Goal

At the end of the course, resident should be able to give an evaluation of the emergency radiographic examinations. He/she should also be familiar with medico legal cases (MLC) procedures.

Essential Objectives

1. Determine and direct radiography in emergency patients and review and interpret the radiographs.
2. If study is incomplete then determine additional views or repeat views.
3. Know indications for and limitations of the common emergency imaging procedures.
4. Communicate findings, diagnosis and other relevant information to the emergency room physician.
5. He/she should be able to perform (some under supervision) and interpret special imaging procedures needed in emergency room e.g; barium studies, excretory urography, CT, ultrasound, Doppler and angiography.

15. ONCOLOGIC RADIOLOGY

Goal

At the end of the rotation the resident should be able to interpret radiological investigations in patients with neoplastic diseases (both benign and malignant). He/she should be able to perform, interpret and diagnose these patients.

Essential objectives

1. Understand pathology and patho-physiology of common neoplasms.
2. Learn the algorithmic approach to image these patients based on the suspected disease, its biological behaviour and potential and limitations of various imaging modalities.

3. Perform appropriate investigation (both conventional and newer methods), interpret the results and reach at a reasonable diagnosis/ differential diagnosis based on the clinical and biochemical results.
4. Learn to communicate the results in a precise way in a written report to the concerned unit.
5. Present interesting cases in the departmental meets.

16. NUCLEAR MEDICINE

Minimum 1 Month posting – SRMCRI / Barnard Institute of Radiology and Oncology.

Goal

At the completion of this rotation the resident should be able to interpret common nuclear medicine examination (including cardiac cases). He / she should be able to evaluate the examinations for completion and determine what further images (including non-nuclear medicine) need to be done.

He / she should have a good understanding of the physical and biological properties of the commonly used radiopharmaceuticals and become familiar with safe handling of isotopes and basic radiation safety measures while dealing with isotopes.

Essentials Objectives:

1. Review all cases performed each day.
2. Interpret the results of the procedures and give an appropriate diagnosis.
3. Observe and help in some common procedures performed in the department (e.g.; thyroid, kidney, bone, cardiac scans), understand the principle underlying the procedure and the basis for using a particular isotope in an investigation.

Evaluation

Day to day by the nuclear medicine staff.

LOG BOOK MAINTENANCE

1. A diary showing each day's work has to be maintained by the candidate which shall be submitted to the head of department for scrutiny on the first working day of each month.
2. A practical record of work done individually or in assistance and details of seminar and journal clubs attended should be included. Lectures / CME'S / state and national conferences attended should also be reflected in the specified columns of the log book.

BOOKS, JOURNALS & OTHER RESOURCES

RECOMMENDED BOOKS.

- | | | |
|---|---|------------------|
| 1. Text book of Radiology and Imaging | - | SUTTON |
| 2. Text book of Diagnosis radiology | - | GRAINGER |
| 3. Christensin's Physics of Diagnostic Radiology | - | CHRISTENSIN |
| 4. Farr's Physics for Medical Imaging
- Penelope Allisy Reoberts, Jenny Williams | - | FARR |
| 5. Fundamentals of Chest diagnostic radiology | - | FELSON |
| 6. AIDS to differential diagnosis | - | CHAPMAN |
| 7. Radiological Procedure | - | CHAPMAN |
| 8. Atlas of Radiological anatomy | - | WEIR ABRAHAMS |
| 9. Positioning in Radiology | - | CLARK |
| 10. Diagnostic Ultrasound | - | RUMACK |
| 11. CT and MRI of whole body | - | HAAGA |
| 12. Radiology review manual | - | WOLFGANG DANHERT |

REFERENCE BOOKS

- | | | |
|--|---|--------------------|
| 1. Chest Radiology | - | ARMSTRONG |
| 2. Alimentary tract imaging | - | MARGULIS |
| 3. Musculoskeletal | - | GREENSPAN / YOUKUM |
| 4. Text book of Neuro Imaging | - | OSBORNE |
| 5. URO Radiology | - | ELKIN |
| 6. H R C T | - | WEBB |
| 7. Pediatric X-Ray Diagnostic | - | CAFFEY |
| 8. Magnetic resonance imaging | - | STARK AND BRADLEY |
| 9. Nuclear Medicine | - | SHELDON BAUM |
| 10. Diagnostic Imaging Series | | |
| 11. Breast Imaging | - | Daniel B KOPANS |
| 12. Diagnostic Ultrasound in obstetric and
Gynecology | - | CALLEN |

JOURNALS

1. Indian Journal of Radiology and Imaging
2. American Journal of Roentgenology
3. Radiology clinics of North America
4. Radiographics
5. Clinical Radiology
6. Seminar in Ultrasound
7. Journal of vascular and Interventional Radiology

8. Journal of computer assisted tomography
9. Clinical nuclear medicine
10. British Journal of Radiology
11. European journal of Radiology.

FORMAT OF LOG-BOOK

RECORD OF DIAGNOSTIC PROCEDURES:

S.No.	Date	Name, Sex	Age,	Hosp. No.	Diagnos is	Procedur e	Role A/PS/P	Follow- up

CLINICAL CASE PRESENTATION/DISCUSSION:

S.No.	Date	Name, Sex	Age,	Hosp. No.	Diagnosi s	Role Presenter/Discussant/Observer

JOURNALCLUB PRESENTATION/DISCUSSION:

S.No.	Date	Name of the article, Author	Journal Year,Month	Role Presenter/Discussant/Observer

SYMPOSIUM PRESENTATION/PARTICIPATION:

S.No.	Date	Topic of the Symposium	Title of the talk	Role Presenter/Discussant/Observer

CONFERENCE/WORKSHOP PARTICIPATION:

Sl.No.	Date	Name of the conference & Venue	Paper/Poster Presented

PUBLICATION:

Sl.No.	Title of the Article	Name of the Journal, issue, year	Role First Author/Co-author

POSTINGS IN OTHER CENTRES:

S.No.	Period of Posting From / To	Name of Institute, Place	

***FACILITIES FOR RESEARCH & PUBLICATIONS**

There is an exclusive Department of Research in the Chettinad University. The research activities are supported by centralized teaching and research laboratories, CPCSEA approved animal house facility, institutional review board, human and animal ethics committee, bio-safety committee, and other monitoring boards. The centralized Nanotechnology laboratory and Genomics Laboratory are value additions developed during the past two years: these are in addition to various dedicated departmental research laboratories.

*** Animal house facility deleted in XX Acad. Meeting dt.25.03.2015.**

Evaluation and Assessment**INTERNAL ASSESSMENT**

1. Postgraduate students have to be assessed periodically by conducting written, practical and viva voce examinations every quarterly.
2. The examination pattern will be similar to the university examination pattern for theory, practical and viva voce.
3. The assessment should also be based on participation in seminars, journal reviews, assessment of performance in teaching and progress in dissertation work.
4. The assessment will be done by all the recognized Postgraduate teachers of the department and the progress should be maintained by the head of the department.

UNIVERSITY EXAMINATIONS

Post graduate examinations shall consist of dissertation / thesis, written paper (Theory), practical clinical and viva-voce.

a. Dissertation / Thesis:

Each candidate shall carry out and submit a dissertation / thesis as explained and approved. Dissertation / thesis shall be precondition for a candidate to appear for the final examination.

b. 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.

Paper I

100 Marks

A. Applied Radiological Anatomy and Radio Physics related to Radio Diagnosis.

Paper II

100 Marks

Radio Diagnosis

(Respiratory system, gastrointestinal system, abdomen including pancreas, adrenals, biliary tree, spleen, liver and acute abdomen and musculoskeletal System)

Paper III

100 Marks

Radio Diagnosis

(Cardiovascular system including lymphatic system arteriography and phlebography Urogenital system including scrotum, Obstetrics and Gynaecology)

Paper IV

100 Marks

A. Recent advances in Radio diagnosis

(Skull and central nervous system. Orbit ENT, Eyes, Teeth and soft tissues. Oncology, Endocrine Radiology, Nuclear Radiology, Interventional Radiology)

Note: The distribution of chapters / topics shown against that papers are suggestive only.

CLINICAL

300 Marks

- | | | | | |
|---------------|---|----------------|---|-----------|
| a. Long case | - | One | - | 100 Marks |
| b. Short case | - | Three (50 x 3) | - | 150 Marks |
| c. spotters | - | (25 x 2) | - | 50 Marks |

Viva voce**100 Marks**

- 1) Worked out cases – Discussions : 40 Marks
- 2) Spot diagnose of cases : 20 Marks
- 3) New and Advanced Imaging : 20 Marks
- 4) Instrument and intervention : 20 Marks

1. All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents of conventional and newer imaging techniques and instruments. In addition, candidates may also be given case reports, charts, gross specimens etc., for interpretation.

DISSERTATION**Thesis**

1. Every candidate pursuing MD degree course is required to carry out work on a selected project under the guidance of a recognized post graduate teacher. The results of such work shall be submitted in the form of a dissertation.
2. The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
3. Chief guide will be from the department of Radio diagnosis while co-guides will be from either the department of radio diagnosis or other disciplines related to the dissertation topic.
4. Every candidate shall submit a thesis protocol to the Dean of the institute in the prescribed proforma containing particulars of proposed dissertation work six months from the date of commencement of the course. The thesis protocol shall be sent through the proper channel.

Protocol in essence should consist of:

- a. Introduction and objectives of the research project.
- b. Brief review of literature.
- c. Materials and methods.
- d. Bibliography.

- a. Such thesis protocol will be reviewed and the dissertation topic will be registered by the institute. No change in the dissertation topic or guide shall be made without prior approval from the Dean of the institute.
- b. Submission of thesis.

Thesis should be submitted at the end of two and a half years.

Thesis should consist of

- a. Introduction
- b. Review of literature.
- c. Aims and objectives.
- d. Materials and methods.
- e. Results.
- f. Discussion.
- g. Summary and conclusions.
- h. Tables.
- i. Annexure.
- j. Bibliography.