BLDE
(DEEMED TO BE UNIVERSITY)

Competency Based Medical Education (CBME)

PG CURRICULUM
2019-20
M.D. Radio-Diagnosis

Published by
BLDE
(DEEMED TO BE UNIVERSITY)
Declared as Deemed to be University u/s 3 of UGC Act, 1956

The Constituent College
SHRI B. M. PATIL MEDICAL COLLEGE, HOSPITAL & RESEARCH CENTRE, VIJAYAPURA
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BLDE(DU)/REG/PG-Curr/2019-20/268 May 06, 2019

NOTIFICATION

Sub: Competency Based Medical Education (CBME) based Revision of Post Graduate Curriculum

Ref: 1. Medical Council of India Regulation on Graduate Medical Education, 1997 and subsequent amendments of the same from time to time.
2. Minutes of the 28th meeting Academic Council of the University held on April 26, 2019.
3. Minutes of the 47th meeting Board of Management held on May 04, 2019.

The Board of Management of the University is pleased to approve the CBME based Revised Curriculum for Post Graduate Degree Course at in its 47th meeting held on May 04, 2019.

The Revised Curriculum shall be effective, from the Academic Session 2020-21 onwards, for Post Graduate Degree Course in the Constituent College of the University viz. Shri B. M. Patil Medical College, Hospital and Research Centre, Vijayapura.

REGISTRAR

REGISTRAR
BLDE (Deemed to be University)
Vijayapura-586103. Karnataka.

To,
The Dean, Faculty of Medicine and Principal
Shri B. M. Patil Medical College,
Hospital and Research Centre,
Vijayapura

Copy to:
- The Secretary, UGC, New Delhi
- The Secretary, MCI
- The Controller of Examinations
- The Vice Principal
- The Vice Principal (Academics)
- The Prof. & HODs Pre, Para and Clinical Departments
- The Co-ordinator, IQAC
- PS to the Hon'ble Chancellor
- PS to the Hon'ble Vice-Chancellor

Our Vision

"To be a Leader and be recognized as an Institution striving for maintenance and enhancement of Quality Medical Education and Healthcare"

Our Mission

- To be committed to promote sustainable development of higher education including Health science education, consistent with the statutory and regulatory requirements.
- Reflect the needs of changing technology and make use of the academic autonomy to identify the academic programs that are dynamic.
- Adopt global concepts in education in the healthcare sector.

Section - I

Goals and General Objectives of Postgraduate Medical Education Program

Goal

The goal of postgraduate medical education shall be to produce a competent specialist and / or a medical teacher as stated in the Post Graduate Medical Education Regulations 2000 and its amendments thereof [May2018]

(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 advances and developments in the discipline concerned.

(iv) Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology, and

(v) Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

General Objectives

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

(i) Recognize the importance of the concerned specialty in the context of the health need of the community and the national priorities in the health sector.

(ii) Practice the specialty concerned ethically and in step with the principles of primary health care.

(iii) Demonstrate sufficient understanding of the basic sciences relevant to the concerned specialty.

(iv) Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and promotive measures/strategies.

(v) Diagnose and manage majority of the conditions in the specialty concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.

(vi) Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability related to the specialty.

(vii) Demonstrate skills in documentation of individual case details as well as morbidity and mortality data relevant to the assigned situation.

(viii) Demonstrate empathy and humane 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 educational needs, select and use appropriate learning resources.
(xii) Demonstrate competence in basic concept of research methodology and epidemiology, and be able to critically analyse 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 team engaged in health care, research or training.

Statement of the Competencies

Keeping in view the general objectives of postgraduate training, each discipline shall aim at development of specific competencies, which shall be defined and spelt out in clear terms. Each department shall produce a statement and bring it to the notice of the trainees in the beginning of the program so that he or she can direct the efforts towards the attainment of these competencies.

Components of the PG Curriculum

The major components of the PG curriculum shall be:

- Theoretical knowledge
- Practical/clinical Skills
- Training in writing thesis/research articles
- Attitudes, including communication.
- Training in research methodology, medical ethics & medicolegal aspects
- Teaching skills to the undergraduates, juniors and support teams

Source: Medical Council of India, Regulations on Postgraduate Medical Education, 2000. [amended upto May 2018]

Eligibility for Admission:

1. Post graduate degree course:

   The candidate seeking admission should have passed MBBS from a college recognized by Medical Council of India.

As per requisites of statutory bodies & as laid out in Post graduate regulations of MCI & its amendments thereof, the minimum percentage of marks obtained in the entrance test

conducted by competent authority shall be as per MCI regulations & its amendments as applicable time to time.

Eligibility for Foreign / PIO / NRI students will be based on qualifying examination marks and MCI amendments as applicable at the time of selection and admission process.

Candidates seeking admission to superspeciality [M.Ch]
The candidate seeking admission to superspeciality course should have passed MS/MD in concerned subjects (As per MCI regulations & its amendments thereof) or passed DNB in concerned broad specialities & should fulfill requirements of MCI regulations.

2. As per requisites of statutory bodies & as laid out in Post graduate regulations of MCI & its amendments thereof, the minimum percentage of marks obtained in the entrance test conducted by competent authority shall be as per MCI regulations & its amendments as applicable time to time.

   Eligibility for Foreign / PIO / NRI students will be based on qualifying examination marks and MCI amendments as applicable at the time of selection and admission process.

The MCI norms to qualify for Admissions

Candidates seeking admission to these Post Graduate Degree courses should have passed M.B.B.S. recognized by Medical Council of India or equivalent qualification and should have obtained permanent Registration from the Medical Council of India or any of the State/ Medical council or candidate should register the same within one month from the date of admission, failing which the admission of the candidate shall be cancelled. Provided that in the case of a foreign national, the MCI may on the payment of prescribed fee for the registration, grant temporary registration for the duration of post graduate training restricted to the medical college/ institute to which the applicant is admitted for the time being exclusively for post graduate studies; provided further, that temporary registration to such foreign national shall be subjected to the condition that such person is duly registered with appropriate registering authority in his /her country wherefrom he has obtained his basic medical qualification ,and is duly recognized by the corresponding Medical Council or concerned authority.

If the candidate fails to fulfill the relevant eligibility requirements as mentioned above he/she will not be considered eligible for admission for Medical Postgraduate Degree Courses even if he/she is placed in the merit list of statutory authority and BLDE (Deemed to be University).

Obtaining Eligibility Certificate by the University before making Admission

Candidate shall not be admitted for any postgraduate degree course unless he/she has obtained and produced the eligibility certificate used by the University. The candidate has to make an application to the University with the following documents along with the prescribed fee:

1. MBBS pass/degree certificate issued by the University.
2. Marks cards of all the university examinations passed MBBS course.
3. Attempt Certificate issued by the Principal
4. Certificate regarding the recognition of the Medical College by the Medical Council of India.
5. Completion of internship certificate.
6. In case internship was done in a non-teaching hospital, a certificate from the Medical Council of India that the hospital has been recognized for internship.
7. Registration by any State Medical council and
8. Proof of SC/ST or OBC or physically handicapped status, as the case may be.

In addition to the above mentioned documents, candidate applying for admission to superspeciality courses has to produce degree/pass certificate of MD/MS/DNB degree with prescribed fee.

Intake of Students

The intake of students to each course shall be in accordance with the ordinance in this behalf.

Course Duration

a. M.D. / M.S. Degree Courses:
The course of study shall be for a period of 3 completed years including examinations. (MCI PG REG 2000 10:1)

b. D.M/M Ch Degree Courses; (MCI PG REG 2000, 10:2)
The duration of these courses shall be for a period of 3 completed years including examinations.

Training Method

The postgraduate training for degree shall be of residency pattern. The post graduate shall be trained with graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions grand rounds, case

demonstration, clinics, journal review meetings, CPC and clinical meetings. Every candidate should be required to participate in the teaching and training program of undergraduate students. Training should include involvement in laboratory and experimental work, and research studies. Basic medical sciences students should be posted to allied and relevant clinical departments or institutions. Exposure to applied aspects of their learning should be addressed. Similarly, clinical subjects' students should be posted to basic medical sciences and allied specialty departments or institutions.

Training of superspeciality [M.Ch] should follow similar pattern. In addition, they have to be trained in advanced techniques of diagnosis and treatment pertaining to their specialty, participate actively in surgical operations as well.

Attendance, Progress and Conduct

A candidate pursuing degree course should work in the concerned department of the institution for the full period as a full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduate course

Each year shall be taken as a unit for the purpose of calculating attendance. Every student shall attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each year as prescribed by the department and not absent himself / herself from work without valid reasons. Every Candidate is required to attend a minimum of 80% of the training during each academic year of the post graduate course. This shall include assignments, assessment of full time responsibilities and participation in all facets of educational process. Provided further, leave of any kind shall not be counted as part of academic term without prejudice to minimum 80% attendance of training period every year. Leave benefits shall be as per university rules.

A post graduate student pursuing degree course in broad specialties, MD, MS and superspeciality courses DM, M.Ch would be required to present one poster presentation, read one paper in 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/her to be eligible to appear at the university degree examinations. (MCI, PG 2000, 13.9)

Any student who fails to complete the course in the manner stated above shall not be permitted to appear for the University Examinations.

Monitoring Progress of Studies

The learning process of students should be monitored through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring is done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment done by using checklists that assess various aspects.

The learning out comes to be assessed include:

- Personal Attitudes,
- Acquisition of Knowledge,
- Clinical and operative skills, skills of performing necessary tests/experiments
- Teaching skills.
- Documentation skills

Personal Attitudes:

The essential items are:

- Caring attitude, empathy
- Initiative in work and accepting responsibilities
- Organizational ability
- Potential to cope with stressful situations and undertake graded responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The Methods used mainly consist of observation. Any appropriate methods can be used to assess these. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers. However every attempt should be made to minimize subjectivity.

Acquisition of Knowledge:

Lectures: Lectures/theory classes as necessary may be conducted. It is preferable to have one class per week if possible. They may, be employed for teaching certain topics. Lectures may be didactic or integrated.

The following selected common topics for post graduate students of all specialties to be covered are suggested here. These topics can be addressed in general with appropriate teaching-learning methods centrally or at departmental level.

- History of medicine with special reference to ancient Indian medicine
- Basics of health economics and health insurance
- Medical sociology, Doctor –Patient relationship, role of family in disease
- Professionalism & Medical code of Conduct and Medical Ethics
- Research Methods, Bio-statistics
- Use of library, literature search ,use of various software and databases

- Responsible conduct of research
- How to write an article, publication ethics and Plagiarism
- Journal review and evidence based medicine
- Use of computers &Appropriate use of AV aids
- Rational drug therapy
- National Health and Disease Control Programmes
- Roles of specialist in system based practice
- Communication skills.
- Bio medical waste management
- Patient safety, medical errors and health hazards
- Patient's rights for health information and patient charter.

These topics may preferably taken up in the first few weeks of the 1st year commonly for all new postgraduates and later in 2nd year or 3rd year as required during their progression of the programme. The specialty wise topics can be planned and conducted at departmental level.

a) Integrated teaching: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, thyroid diseases etc. They should be planned well in advance and conducted.

Journal Review Meeting (Journal club):

The ability to do literature search, in depth study, presentation skills, use of audio – visual aids, understanding and applying evidence based medicine are to be focused and assessed. The assessment is made by faculty members and peers attending the meeting using a checklist

Seminars / symposia:

The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio – visual aids are to be assessed using a checklist.

Clinico-Pathological conferences:

This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

Medical Audit: Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

Clinical Skills: Day to Day Work: Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills

Clinical Meetings:

Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list.

Group discussions: Group discussions are one of the means to train and assess the student's ability to analyse the given problem or situation, apply the knowledge and make appropriate decisions. This method can be adopted to train and assess the competency of students in analyzing and applying knowledge.

Death review meetings/Mortality meetings: Death review meetings is important method for reflective learning. A well conducted morbidity and mortality meetings bring about significant reduction in complications, improve patient care and hospital services. They also address system related issues. Monthly meetings should be conducted with active participation of faculty and students. Combined death review meetings may be required wherever necessary.

Clinical and Procedural Skills:

The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book.

Teaching Skills:

Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students

Attitude and Communication skills:

Candidates should be trained in proper communication skills towards interaction and communication with patients, attendees and society in general. There should be appropriate training in obtaining proper written informed consent, discussion and documentation of the proceedings. Structured training in various areas like consent, briefing regarding progress and breaking bad news are essential in developing competencies.

Variety of teaching –learning methods like Role play, video based training, standardized patient scenarios, reflective learning and assisting the team leader in all these areas will improve the skills. Assessment can be done using OSCE simulated scenarios and narratives or any appropriate means. Training to work as team member, lead the team whenever situation demands is essential. Mock drills to train and assess the readiness are very helpful.

Work diary / Log Book:

Every candidate shall maintain a Work Diary/Log Book and record his/her participation in the training programs conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, conducted by the candidate. A well written and validated Log Book reflects the competencies attained by the learner and points to the gap which needs address. This Log Book shall be scrutinized by concerned teachers periodically and certified, by the Head of Department and Head of the Institution, and presented during University Practical / Clinical examination.

Periodic tests:

In case of degree courses of three years duration (MD/MS, DM, M.Ch), the concerned departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practical / clinical and viva voce.
One of these practical/clinical tests should be conducted by OSPE (objective structured practical examination or OSCE (objective structured clinical examination) method.
Records and marks obtained in such tests will be maintained by the Head of Department and sent to the University, when called for,

Assessment

Assessment should be comprehensive & objective. It should address the stated competencies of the course. The assessment needs to be spread over the duration of the course.

FORMATIVE ASSESSMENT, ie., assessment during the training would include:
Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles
Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning: it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the Postgraduate training course should be based on following educational activities:

1. Journal based/recent advances learning
2. Patient based/Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and outreach Activities/CMEs

Records: Records and marks obtained in tests will be maintained by the Head of the Departments and will be made available to the University or MCI.

Procedure for defaulter:

Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Dissertation: Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis and comparison of results and drawing conclusions.

Every candidate shall submit to the Registrar (Academic) of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.

Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.

The dissertation shall be written under the following headings:

1. Introduction
2. Aims or Objectives of study
3. Review of Literature
4. Material and Methods
5. Results

6. Discussion
7. Conclusion
8. Summary
9. References
10. Tables
11. Annexure

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexure. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

Adequate number of copies as per norms and a soft copy of dissertation thus prepared shall be submitted to the Controller of Examinations six months before final examination on or before the dates notified by the University.

The dissertation shall be valued by examiners appointed by the university. Acceptance of dissertation work is an essential precondition for a candidate to appear in the University examination.

Guide:

The academic qualification and teaching experience required for recognition by this University as a guide for dissertation work is as per Medical Council of India Minimum Qualifications for Teachers in Medical Institutions Regulations, 1998 and its amendments thereof. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as Lecturer or Assistant Professor gained after obtaining post graduate degree shall be recognized as post graduate teachers.

A Co-guide may be included provided the work requires substantial contribution from a sister department or from another medical institution recognized for teaching/training by this University / Medical Council of India. The co-guide shall be a recognized post graduate teacher of BLDE (Deemed to be University).

Change of guide:

In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

Schedule of Examination:

The examination for M.D. /M.S and DM/M.Ch courses shall be held at the end of three academic years. The university shall conduct two examinations in a year at an interval of four to six months between the two examinations. Not more than two examinations shall be conducted in an academic year.

Scheme of Examination

M.D. /M.S. Degree

M.D. / M.S. Degree examinations in any subject shall consist of dissertation, written papers (Theory), Practical/Clinical and Viva Voce.

Dissertation:

Every candidate shall carryout work and submit a Dissertation as indicated above. Acceptance of dissertation shall be a precondition for the candidate to appear for the final examination.

Written Examination (Theory):

Written examination shall consist of **four** question papers, each of **three** hours duration. Each paper shall carry 100 marks. Out of the **four** papers, the 1st paper in clinical subjects will be on applied aspects of basic medical sciences and 4th paper on Recent advances, which may be asked in any or all the papers. In basic medical subjects and para-clinical -subjects, questions on applied clinical aspects should also be asked.

Practical / Clinical Examination:

In case of practical examination, it should be aimed at assessing competence and skills of techniques and procedures as well as testing students ability to make relevant and valid observations, interpretations and inference of laboratory or experimental work relating to his/her subject.

In case of clinical examination, it should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine at least one long case and two short cases minimum. However additional assessment methods can be adopted which will test the necessary competencies reasonably well.

The total marks for Practical / Clinical examination shall be 300.

Viva Voce:

Examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills.

The total marks shall be 100:

- 80 Marks, for examination of all components of syllabus
- 20 Marks for Pedagogy

Examiners:

There shall be at least four examiners in each subject. Out of them two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

Criteria for pass & distinction: Criteria for declaring as pass in University Examination: A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory, (2) Practical/clinical and (3) viva voce examination. The candidate should pass independently in practical/clinical examination and Viva Voce: vide MCI pg 2000 Reg no 14(4) (Ciii)

Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.[amendment of MCI PG Regulations clause 14 dated 5.4.2018]

A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Controller of Examinations.

Declaration of distinction: A successful candidate passing the University examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate of marks is 75 percent and above.
Distinction will not be awarded for candidates passing the examination in more than one attempt.

D.M/M.Ch Degree

DM/M.Ch Degree examinations in any subject shall consist of written theory papers (theory), practical/clinical and Viva voce.

Written Examination (Theory):

Written examination shall consist of **four** question papers, each of **three** hours duration. Each paper shall carry 100 marks. Out of the **four** papers, the 1st paper in clinical subjects will be on applied aspects of basic medical sciences. Recent advances may be asked in any or all the papers. In basic medical subjects and para-clinical -subjects, questions on applied clinical aspects should also be asked.

Practical / Clinical Examination:

In case of practical examination, it should be aimed at assessing competence and skills of techniques and procedures as well as testing students ability to make relevant and valid observations, interpretations and inference of laboratory or experimental work relating to his/her subject.

In case of clinical examination, it should aim at examining clinical skills, competence of candidates for undertaking independent work as a specialist. Each candidate should examine at least one long case and two short cases.

The total marks for Practical / clinical examination shall be 300.

Viva Voce:

Examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills.

The total marks shall be 100:

- 80 Marks, for examination of all components of syllabus
- 20 Marks for Pedagogy

Examiners: There shall be at least four examiners in each subject. Out of them two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

Criteria for passing and distinction: Criteria for declaring as pass in University Examination: A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory, (2) Practical including clinical and (3) viva voce examination. The candidate should pass independently in practical/clinical examination vide: MCI pg 2000 Reg no 144-c (iii).

Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.[amendment of MCI PG Regulations clause 14 dated 5.4.2018]

Declaration of distinction: A successful candidate passing the University examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate of marks is 75 percent and above.

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Declaration of distinction: A successful candidate passing the University examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate of marks is 75 percent and above.
Distinction will not be awarded for candidates passing the examination in more than one attempt.

Number of candidates per day: The maximum number of candidates for practical / clinical and viva-voce examination shall be as under:

MD / MS Courses: Maximum of 8 per day
DM/M.Ch Maximum of 3 per day

Additional annexure to be included in all curricula

Postgraduate Students Appraisal Form
Pre/Para/Clinical Disciplines

Name of Department/Unit :
Name of the PG Student :
Period of Training : FROM…… TO……..

Sr. No	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1	Journal based/recent advances learning				
2	Patient based /Laboratory or Skill based learning				
3	Self directed learning and teaching				
4	Departmental and interdepartmental learning activity				
5	External and Outreach Activities/CMEs				
6	Thesis/Research work				
7	Log Book Maintenance				

Publications Yes/No

Remarks* ……..
…….
…….
……

*Remarks: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE SIGNATURE OF GUIDE

SIGNATURE OF HOD SIGNATURE OF UNIT CHIEF

SECTION II

M. D. Radio-Diagnosis

Goal

The goal of the course is to orient the students on various aspects of radiology by way of theory and practical training in the diseases of various systems of the human body. They should be able to apply knowledge and skills at secondary and tertiary level of medical care.

The postgraduate training course would be to train a MBBS doctor who will:

- Practice efficiently and effectively the specialty, backed by scientific knowledge and skill base.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing education in the specialty irrespective of whether he is in a teaching institution or is a practicing specialist.
- Be a motivated 'teacher' – defined as a specialist keen to share his knowledge and skills with a colleague or a junior or any learner.
- Well versed with medical ethics, consumer protection act and PCPNDT**.**

Objectives

A resident on completing his/her MD (Radio-diagnosis) should have acquired good basic knowledge in the various sub-specialties of radiology such as Neuro-radiology, GI-radiology, Uro-radiology, Vascular-radiology, Musculoskeletal, Interventional radiology, Emergency radiology, Pediatric radiology and Mammography, and be able to Independently conduct and interpret all routine and special radiological and imaging investigations.

Provide radiological services in acute emergency and trauma including its medico legal aspects. Formulate basic research protocols and carry out research in the field of radiology related clinical problems.

To Undertake further specialization in any of the above mentioned branches in Radio-diagnosis such as Gastrointestinal radiology, Uro- radiology, Neuroradiology, Vascular radiology, Musculoskeletal radiology, Interventional radiology etc.

To interact with other specialists and super-specialists so that maximum benefit to the patient accrues.

Work as a Senior Resident/consultant in Radio-diagnosis and conduct the teaching programme for undergraduates, postgraduates as well as paramedical and technical personnel.

Organize CME in the specialty utilizing modern methods of teaching and evaluation

SPECIFIC LEARNING OBJECTIVES

The objective of the program is to train a student to become a skilled and competent radiologist to conduct and interpret various diagnostic/interventional imaging studies (both conventional and advanced imaging), to organize and conduct research and teaching activities and be well versed with medical ethics and legal aspects of imaging/ intervention.

SUBJECT SPECIFIC COMPETENCIES

A. Cognitive Domain:

A post graduate student on completing MD (Radiodiagnosis) should acquire knowledge in the following areas, and be able to:

1. Acquire good basic knowledge in the various sub-specialties of radiology such as chest radiology, neuro-radiology, GI-radiology, uro-radiology, cardio-vascularradiology, musculoskeletal, interventional radiology, emergency radiology, pediatric radiology and women's imaging. 2

2. Independently conduct and interpret all routine and special radiologic and imaging investigations.

3. Provide radiological services in acute emergency and trauma including its medicolegal aspects.

4. Elicit indications, diagnostic features and limitation of applications of ultrasonography, CT and MRI and should be able to describe proper costeffective algorithm of various imaging techniques in a given problem setting.

5. Decide on the various image-guided interventional procedures to be done for diagnosis and therapeutic management.

6. Able to decide on further specialization to be undertaken in any of the branches in Radiodiagnosis such as gastrointestinal radiology, uro-radiology, neuro-radiology, vascular radiology, musculoskeletal radiology, interventional radiology etc.

7. Able to formulate basic research protocols and carry out research in the field of radiology- related clinical problems.

8. Acquire knowledge and teaching capabilities to work as a post graduate student /consultant in Radiodiagnosis and conduct teaching programmes for undergraduates, post graduates as well as paramedical and technical personnel.

9. Interact with other specialists and super-specialists so that maximum benefit accrues to the patient.

10. Should be able to organize CME activities in the specialty utilizing modern methods of teaching and evaluation.

11. Acquire knowledge to impart training in both conventional radiology and modern imaging techniques so that the post graduate student is fully competent to practice, teach and do research in the broad discipline of radiology including ultrasound, Computed Tomography and Magnetic Resonance Imaging.

12. Acquire knowledge of interventional radiology.

B. Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.

2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain:

Practical Training will include two major aspects:

A) Interpretation of images, and

B) Skill in performing a procedure.

A) Interpretation of images:

The student should be able to interpret images on all imaging modalities of diseases of following organs :

1. Musculo-skeletal System - Interpretation of diseases of muscles, soft tissue, bones and joints including congenital, inflammatory, traumatic, endocrine and metabolic, neoplastic and miscellaneous conditions.

2. Respiratory System - Interpretation of diseases of the chest wall, diaphragm, pleura and airway; pulmonary infections, pulmonary vasculature; pulmonary neoplasm; diffuse lung disease; mediastinal disease, chest trauma; post-operative lung and X-ray in intensive care.

3. Cardiovascular System - Interpretation of diseases and disorders of cardiovascular system (congenital and acquired conditions) and the role of imaging by conventional radiology, ultrasound, colour Doppler, CT, MRI, Angiography and Isotopes Studies.

4. Gastro-intestinal tract and hepato-biliary pancreatic system - Interpretation of diseases and disorders of mouth, pharynx, salivary glands, esophagus, stomach, small intestine, large intestine, diseases of omentum, peritoneum and mesentery: acute abdomen, abdominal trauma. Diseases and disorders of liver, biliary system and pancreas.

5. Urogenital System - Interpretation of various diseases and disorders of genitorurinary system. These include: congenital, inflammatory, traumatic, neoplastic, calculus disease and miscellaneous conditions.

6. Central Nervous System (C.N.S.) - Interpretation of diseases and disorders of the head, neck and spine covering, congenital, infective, vascular, traumatic neoplastic degeneration metabolic and miscellaneous condition.

7. Imaging in Emergency Medicine.

8. Imaging in Obstetrics and Gynecology.

9. Imaging of Breast and interventional procedures.

11. ENT, EYE and Dental Imaging. 11. Imaging of endocrine glands and those involved with metabolic diseases.

12. Clinical applied radionuclide imaging.

13. Interventional Radiology

B) Skills in performing a procedure

The student should be able to perform the following procedures:

1) GIT contrast studies: Barium studies (swallow, upper GI, Follow through, enema); 4 fistulogram; sialogram; cologram/ileostogram,

2) GU: Excretory urography, MCU, RGU, nephrostogram, genitogram,

3) Ultrasound: Studies of whole body including neonatal transfontanell studies, Doppler studies

4) CT scan: should be able to position a patient, plan study as per the clinical indication, do reconstruction of images, perform triple phase study, perform & interpret advanced applications like CT enterography, CT angiography etc.

5) MRI: plan and perform MRI studies of whole body

6) DSA: should be able to describe the techniques, do (if available to student) transfemoral puncture and insert catheter, help in angiographic procedures both diagnostic and interventional.

7) Radiography: should be able to independently do radiography of common and some important uncommon views of different body parts. This includes positioning, centering of X ray beam, setting of exposure parameters, exposing and developing the films. The student should be familiar with not only conventional radiography but with CR and DR systems.

8) Interventional radiology: The student should be able to perform simple, common non- vascular procedures under ultrasound and fluoroscopy guidance e.g. abscess drainage, drainage catheter placement, nephrostomy, biliary drainage etc. The student should have knowledge of common vascular interventions e.g stricture dilatation using balloon catheters, embolization with gel foam and other agents, names of common catheters, handling of intravenous contrast reactions; techniques, indications and contraindications for various procedures.

Postgraduate Training

The training is spread over 3 years and includes following components:

General Principles Acquisition of practical competencies being the keystone of postgraduate medical education, postgraduate training is skill oriented. Learning in postgraduate program is essentially self directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort.

Teaching Sessions - In addition to conducting and reporting of routine and special investigation in the area of posting under direct supervision, formal teaching session will be held on working days. These include seminars in physics and general radiology, journal clubs, case presentations; Interdepartmental meets, Film reading session

Teaching Schedule - departmental teaching schedule will be as follows:

- Seminars – once a week
- Case discussion - once a week
- Journal club - once a week

- Group discussion - once a week
- Film Reading / Physics Seminar Once a week Note:
- Research methodology and thesis.
- PCPNDT Act.
- Medical ethics
- OSPE
- Pedagogy

All sessions will be co-ordinated by the faculty members. All the teaching sessions to be assessed by the consultants at the end of session and graded Attendance of the Residents at various sessions should be at least 75%.

I. Practical radiography

- Filmless radiography techniques.
- Radiography of the extremities
- Radiography of the spine, abdomen, pelvic girdle and thorax
- Radiography of the skull
- Contrast techniques and interpretation of GI tract, biliary tract, etc.
- Contrast techniques and interpretation of the Genito-urinary system
- Contrast techniques and interpretation of the central nervous and Cardiovascular system
- Macro-radiography and magnification techniques
- Dental and portable radiography.

A. RADIOLOGICAL PHYSICS & X-RAY TECHNOLOGY:

1. Radiation
2. Production of X –Rays
3. X- Ray Generators
4. Basic Interaction between X- Rays and Matter
5. Attenuation
6. Filters
7. X- Ray beam restrictors
8. Fluoroscopic imaging and image intensifier
9. Viewing & recording of the Fluoroscopic Image
10. Radiographic Image
11. Geometry of the Radiographic Image
12. Computed Tomography
13. Ultrasound
14. Digital Radiography
15. Magnetic Resonance Imaging
16. Radiation hazards & Protection
17. Atomic structure, Radioactive Isotopes
18. Positron Emission Tomography
19. Digital Subtraction Angiography
20. Pictorial Achieving & Communicating System (PACS)
21. DICOM

B. DARK ROOM TECHNIQUES:

1. CR Cassette: .construction & care
2. Factors affecting image details
3. Factors affecting image contrast & density
4. Grids : construction & types
5. Cones & collimator
6. Computers in radio-diagnosis

C. BASIC RADIOLOGY I. IMAGING TECHNIQUIES AND MODALITIES

a) Department Organization:

1. Digital Imaging and PACS
2. Processing in Computed Radiography
3. Intravascular Contrast Media
4. Radionuclide imaging General Principles
5. Mammography – conventional, Sonomammography, MR mammography, digital mammography, Ductography
6. Dual Energy X-ray Absorptiometry
7. Medicolegal issues in Diagnostic Radiology
8. Radiation Protection and patient doses in diagnostic radiology

RESPIRATORY SYSTEM:

1. **Techniques of Investigations**
   - Standard Techniques;
   - Digital Radiography
   - Magnetic Resonance Imaging
   - Ultrasound
   - Angiography
   - Lung Biopsy & Other Interventional Techniques.

2. **Normal Chest:**
   - The Lungs (Radiological Anatomy)
   - The Central Airways
   - The Lungs beyond Hila
   - The Hila

3. **The Mediastinum:**
   - CT & MRI
   - Plain film appearances of Mediastinal Masses:
   - Thyroid/ Para Thyroid Masses/ Thymic tumors/Thymic hyperplasia/Teratoma/ Germ Cell Tumor.
   - Mediastinal lymphadenopathy
   - Neurogenic Tumors
   - Extra medullar heamatopoiesis/Mesenchymal tumors/ herniations of / Mediastinal lipomatosis/ Aneurysm.
   - Differential diagnosis.

4. **The Chest Wall, Pleura & Diaphragm**

a) **Chest Wall**: i) Soft tissue /Breasts, ii) Ribs /Sternum/Clavicle, Spine 2
b) **The Pleura**: i) Normal Pleura, ii) Pleural Pathologies
c) **The Diaphragm**:
   i. Height/ Eventration/Movements/Paralysis
   ii. Hernias/Trauma/Neoplasm

5. **Pulmonary Infections in Adults.**

- Pneumonia
- Associated features and complications of pneumonia
- Pulmonary tuberculosis
- HIV & AIDS

6. **Large Airway Obstruction**
   Collapse: General features /Collapse of individual lobes / entire lung/ segmental collapse/ Rounded /obstructive collapse Obstructive Pneumonitis/ Bronchoscope/Bronchiectasis

7. **Pulmonary lobar Collapse essential considerations**

8. **Chronic airway obstruction**
   - Asthma:
   - Chronic Bronchitis and Emphysema
   - Bronchiolitis

9. **Pulmonary Neoplasm:**
   1 Bronchial Carcinomas 2 Benign Pulmonary Tumors 3 Malignant Lymphoma 4 Metastases 5 The solitary Pulmonary Nodule

10. **Diffuse Pulmonary. Disease / Industrial Lung Disease / HRCT:**
    1 Pulmonary Edema, 2 Diffuse pulmonary Hemorrhage, 3 Inhalation of particulate matter, 4 Diffuse pulmonary Fibrosis, 5 Sarcoidosis / Collagen Vascular Disease / Systemic Vasculitidis / Lymphoid Disorders of Lungs / Pulmonary Eosinophilia / Drug induced Lung Disease.

11. **Chest Trauma**

12. **Pulmonary thrombo-embolism: chest radiograph / radionuclide** study / pulmonary arteriography CT / MRI.

13. **post operative and critically ill patients**

14. **Congenital Pulmonary Anomalies:**
    - Abnormal development of lung bud
    - Abnormalities of separation of lung bud from foregut
    - Abnormalities of pulmonary vasculature
    - Ectopic hemartomatous developments.
    - The infant and young child:

15. **Pathologies of diaphragm:**
    - Pleural abnormalities
    - Inflammation

- Airway obstruction
- Diffuse lung disease
- Respiratory distress in newborn

16. Interventional techniques in thorax:

- Biopsy procedures
- Thoracic drainage procedures
- Therapeutic embolisation
- Dilatation and stenting techniques
- Extraction techniques.

III. The Heart and Great Vessels

1. Cardiac Anatomy and Enlargement

- Plain radiography
- Enlargement of various chambers on plain radiography

2. Magnetic Resonance Imaging of heart and blood vessels

3. Congenital Heart Disease:

- General Principles
- Left to right shunts
- Other Congenital Heart Disease
- Diagnostic signs to diagnose them

4. Acquired Heart Disease

- Non Rheumatic/ Rheumatic Mitral VD
- Tricuspid VD
- Aortic VD
- Diagnostic signs to diagnose them
-

5. Ischemic Heart DiseaseMyocardial Infarction

- Mechanical complications of MI
- Diagnostic signs to diagnose them

6. Pulmonary Circulation:

- Anatomy and Physiology
- Pulmonary Vascularity in Heart Disease
- Pulmonary Arterial hypertension/ Its Imaging
- MR in Pulmonary Vascular Abnormalities.

7. **Imaging in Cadiomyopathy, Cardio Tumors, Trauma**
8. **The pericardium**
9. **Thoracic Aorta**

THE GASTROINTESTINAL TRACT

1. **The Esophagus**
   - Anatomy and Functions
   - Methods of Examination
   - Pathologies of Esophagus
   - Motility Disorders
   - Extrinsic lesions/ miscellaneous conditions

2. **The Stomach**
   - Radiological anatomy and methods of examination
   - Inflammatory Diseases
   - Neoplastic Conditions
   - Peptic ulcers
   - Volvulus

3. **The Duodenum**
   - Anatomy and Normal Appearances
   - Methods of Radiological Examination
   - Peptic ulceration
   - Diverticula
   - Neoplasms benign and malignant

4. **The Small Intestine**
   - Anatomy and normal appearances
   - Methods of radiological examination
   - Crohn’s disease/Coeliac Disease/Neoplasms/various conditions.

5. **The Large Bowel**
   - Anatomy and Normal Appearances
   - Methods of Radiological Examination
   - Tumors

- Diverticular Disease
- Colitis
- AIDS
- Miscellaneous Conditions

- Peritoneum, Mesentery and Omentum
- Peritoneal spaces and reflections
- Abnormalities of Peritoneum
- Abnormalities of Mesentery
- Abnormalities of Omentum

7. Gastrointestinal Angiography.

- General Consideration
- Gastro intestinal bleeding

8. Pediatric Gastrointestinal Radiology

- The Neonate
- The Infant and Older Child

9. Interventional Radiology in Gastrointestinal tract

- Introduction
- Esophagus.
- Stomach and Duodenum
- Small Intestines
- Colon and Rectum

V. Liver, Biliary tract, Pancreas, Endocrine System and Lymphoma Liver

1. Liver

- Normal and variant Anatomy
- Liver Imaging Techniques
- Diffuse Disease
- Focal Disease
- Intervention

2. The Biliary Tract

- Anatomic Consideration
- Methods of investigation

- Biliary Disorders

3. Interventional Techniques Hepatobiliary System

- Liver Biopsy
- Biliary Obstruction
- Malignant Biliary Obstruction
- Percutaneous Cholangiography and Biliary Drainage Procedures
- Vascular Interventional Techniques in Hepatobiliry System

4. The Pancreas

- Embryology and Anatomy
- Congenital Anomalies
- Multisystem Diseases with Pancreatic involvement
- Pancreatitis
- Pancreatic Neoplasms
- Trauma
- Interventional Radiology in Pancreas

5. Imaging of the Endocrine System:

- Hypothalamic-Pituitary Axis
- Pineal Gland
- Thyroid Gland
- Parathyroid Gland
- Pancreatic & Gastrointestinal Endocrine Disorders
- Carcinoid Tumors
- Adrenal Glands

6. Reticuloendothelial Disorders: Lymphoma

- Histopathological Classification
- Staging Investigation and Management
- Extranodal Manifestation of Lymphoma
- Monitoring response to therapy Reticuloendothenial Disorders:

7. The Spleen

- Imaging Techniques
- Normal Anatomy
- Splenomegaly
- Benign Mass Lesions
- Malignant Mass Lesions
- Splenic Trauma

VI. Genito Urinary Tract

1. Methods of Investigation:

2. Reno Vascular Disease:

- Renal Arteriography

- Vascular Abnormalities
- Radiological Management of Reno Vascular Disease

3. **Renal Parenchymal Disease**
    - Normal Appearance of Kidney
    - Renal Parenchymal Disease
    - Parasitic Infections

4. **Renal Masses**
    - Methods of Analysis
    - Pathological Renal Masses
    - Neoplastic Renal Masses

5. **Calculus Disease & Urothelial Lesions**
    - Calculus Disease
    - Nephrocalcinosis
    - Urothelial Tumors

6. **Urinary Obstruction:**
    - Pathophysiology
    - Causes of Obstruction

7. **Radiological Evaluation of Urinary Bladder, Prostrate & Urethra**

8. **Injuries to the Genito Urinary Tract**

9. **Renal Failure and Transplantation**

10. **Interventional Uroradiology**

11. **Imaging of the Kidneys & Urinary Tract in Children**
    - Embryology
    - Techniques
    - Interventional Procedure

12. **Imaging of Pediatric Pelvis**
    - Imaging Techniques
    - Normal Anatomy
    - Congenital Anomalies
    - Pelvis Masses
    - Scrotal Disease

VII. Skeletal System

1. **Skeletal Trauma**
2. **Bone Tumors: Generals Characteristic & Benign Lesions**
3. **Bone Tumors: Malignant Lesions**
4. **Myelproliferative and Similar Disorders**
   - Generalized/Localized Decreased in Bone Density
   - Generalized/Localized Increased in Bone Density
   - Delayed Skeletal Maturity
5. **Metabolic and Endocrine Disease of the Skeletal**
6. **Skeletal Dysplasias and Malformation Syndrome**
7. **Joints Diseases**
   - Rhumatiod Arthritis
   - Other Connective Tissue Disease
   - Crystal Deposition Arthropathy
   - Degenerative Joint Disorders/Degenerative spine
   - Arthrography/ HPOA/ Pachy Dermoperiostritis
8. **Bone and Soft tissue Infection**
9. **Imaging of Soft tissue**
10. **The Radiology of Non Accidental Injury in Children**
11. **Paediatric Musculo -Skeletal Trauma**

VIII. The Reproductive System

1. **imaging in infertility**
2. **Imaging in Gynaecology**
3. **Hysterosalpingography**
4. **Male Reproductive System**

IX. Central Nerve System

1. Methods of Examination and Anatomy

2. **Cranial and Intracranial Pathology**:
   - Tumors in Adults
   - Cerebro Vascular Disease and Non Traumatic Intracranial Hemorrhage
   - Infections, AIDS
   - Demyelinating and Metabolic Disease

3. **Spine: Method of Investigation**

4. **Imaging of Spinal Pathology**

5. **Neonatal Head and Spine Sonography**

6. **Neurology in Children – normal development & developmental disorders**

X. The Orbit; ENT; Face; Teeth:

1. **The Orbit**
   - Anatomy
   - Intraoccular Abnormalities
   - Lacrimal Gland Tumors
   - Muscular Tumors
   - Intra/Extra Conal Tumors
   - Proptosis
   - Infection
   - Developmental abnormalities.

2. **Ear, Nose and Throat Radiology (anatomy, congenital disorders, infection & neoplasms)**
   - The Ear
   - Nose and Paranasal Sinuses
   - Pharynx

3. **Maxillofacial Radiology**
   - Fractures of Maxilla
   - TM Joint
   - Salivary Glands
   - Dental Radiology

XI. Interventional radiology:

1. HSG & FTR
2. 4 vessel angiography
3. Biliary intervention(PTBD,PTC)
4. PCN
5. Laser ablation of varicose veins
6. RFA/ chemoembolisation of hepatic tumors and malformations.
7. Vertebroplasty.
8. Hemangioma and AVM management.
9. Tumor ablation

Teaching Program

Each year should be taken as a unit for the purpose of calculating attendance.

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

A list of teaching and learning activities designed to facilitate acquisition of essential knowledge and skills outlined is given below.

1. **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 postgraduate students suggested topics are as follows :
      1) Bio-statistics.
      2) Use of library
      3) Research Methods
      4) Medical code of Conduct and Medical Ethics.
      5) Communication Skills etc.
      6) Initial introductory lectures about the subject.

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 teams for selected topics, e.g. Jaundice, Diabetes Mellitus and 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 allotted journal(s) of selected articles 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.
4. **Student Symposium:** Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.
5. **Film reading session**- once a week interesting x- ray films of teaching importance from the department are presented and discussed for imaging findings and possible diagnosis with differential diagnosis.
6. **Research methodology -** the student will attend the lecture series by medical education department about research methodology. This will be done preferably before the selection of thesis topic.
7. **Mortality & Morbidity Meetings:** Recommended once a month for all postgraduate students. Presentation will be done by rotation and by the students who had conducted/assisted anesthetic management.
8. **Group discussions:** Strongly recommended at least once a month. These meetings should be attended by postgraduate students and relevant entries must be made in the Logbook.
9. **Teaching skills:** Postgraduate students must teach Undergraduate students by taking demonstrations, lectures etc. Assessment is made using a checklist by faculty. Record of their participation should be kept in Logbook. Training of postgraduate students in Educational Technology is recommended.
10. **Continuing Medical Education Programmes (CME):** At least 2 state / national level CME programmes should be attended by each student in 3 years.
11. **Conferences:** one national conference during the training period and presentation of scientific paper / poster is encouraged.
12. **Medical ethics –** relevant topics will be covered in form of guest lectures by eminent faculties.
13. **OSPE – to** develop methodical approach for reporting of x-ray / USG /CT / MRI exercises will be developed for students depending on their radiological postings.
14. **Pedagogy-** sessions will be conducted once in three months for developing communications skills.

Posting

The postgraduate students should be posted in all sections (conventional radiology, USG, CT, MRI etc), so that there is adequate exposure to all modalities.
The proposed duration of posting is as under-

Conventional	6 months
USG	8 months
CT	8 months
MRI	8 months
DSA	2 months
Mammography	2 months
Elective / selective	2 months

Dissertation

1. Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

2. The dissertation is aimed to train a post graduate 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 and comparison of results and drawing conclusions.

3. Every candidate shall submit to the ethical committee of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.

4. Such synopsis will be reviewed and the dissertation topic will be approved / modified by ethical committee. No change in the dissertation topic or guide shall be made without prior approval of the University.

5. The dissertation should be written under the following headings:

    i. Introduction
    ii. Aims or Objectives of study
    iii. Review of Literature
    iv. Material and Methods
    v. Results

vi. Discussion
vii. Conclusion
viii. Summary
ix. References (Vancouver style)
x. Tables
xi. Annexures

6. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

7. Four copies of dissertation thus prepared shall be submitted to the controller of examination, six months before final examination on or before the dates notified by the University.

8. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring of various teaching / learning activities must be done by the faculty of the department.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) Personal Attitudes. The essential items are:

- Initiative
- Organizational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) Acquisition of Knowledge: The methods used comprise of `Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist

Seminars: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio-visual aids are to be assessed using a checklist

Group discussion: This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) Clinical skills

Day to Day work: The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills.

Clinical meetings: Candidates should periodically present cases to his peers and faculty members.

Clinical and Procedural skills: The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the logbook.

iv) Teaching skills: Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students.

v) Dissertation in the Department: Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalization for critical evaluation and another before final submission of the completed work.

v) *Periodic tests:* The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) Work diary / Log Book- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) Records: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The logbook is a record of the important activities of the candidates during his training; internal assessment should be based on the evaluation of the logbook. Collectively, logbooks are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

i) Theory

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper – I **100 marks**

Basic Sciences as applied to Radio-Diagnosis –Radiation Physics, anatomy & physiology

- Radiological physics & x-ray technology.
- Dark room.
- Imaging techniques.
- Mammography – technique and interpretation.
- Anatomy, development & physiology as applicable to radiology.

Paper – II **100 marks**

- Respiratory system
- Gastrointerstinal system and abdomen (including Pancreas, Adrenals, Biliary tree, Spleen, Liver and acute abdomen).
- Recent advances & interventions as applicable to the above topics

Paper – III **100 marks**

- Cardiovascular system including Lymphatic system, Arteriography.
- Urogenital system including Scrotum and Obstetrics and Gynaecology
- Musculoskeletal system and soft tissue.
- Recent advances & interventions as applicable to the above topics.

Paper – IV **100 marks**

- Skull and Central Nervous system; ENT, Eyes.
- Head & Neck.
- Recent advances and interventions as applicable to the above topics.

ii. Clinical **300 marks**

a) Long Case – One - **120 Marks**
b) Short Cases – two - **120 Marks (60 x 2)**
c) Spotters (30 films) - **60 Marks**

iii. Viva-Voce **100 marks**

1. Newer imaging techniques and instrumentation 20 marks
2. Physics Viva-voce ; 40 Marks
3. Log book 20 marks
4. Pedagogy Exercise: 10 marks
5. OSPE 10 Marks

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

Maximum marks for	Theory	Practical	Viva	Grand Total
MD Radio-Diagnosis	400	300	100	800

Recommended Text Books:

Text Book of Radiology and Imaging	David Sutton
Grainger & Allison's Diagnostic Radiology	Grainger
Clark Positioning Radiography	Clark
Fundamental Physics of Radiology	Christensen
Radiographic Anatomy	Meschan
Diagnostic Ultrasound	Sarthi
Essentials of Radiological imaging	Paul & Juhls

Reference Books

Felson's principle of chest roentgenology	Felson
Diagnostic Ultrasound	Rummack
Diagnostic neuroradiology	Anne Osborn
Aids to differential diagnostic	Chapman
Diagnostic Radiology CT & MRI of whole body	Haaga
Pediatric diagnostic imaging	Caffey's
High Resolution Computed Tomography	W.RWebb

Journals

1. Indian Journal of Radiology and Imaging
2. Clinical Radiology
3. British Journal of Radiology
4. American Journal of Roentgenology
5. Radiology clinics in North America
6. Recent Advances in Radiology and Imaging
7. Journal of Diagnostic Medical Sonography
8. Seminar in Ultrasound
9. Clinical Nuclear Medicine
10. Radiographics & Radiology

SECTION III

Format of Model Check Lists

Check List-I.

MODEL CHECK-LIST FOR EVALUATION OF SEMINAR BASIC PRESENTATIONS

Name of the Student: _____

Name of the Faculty/Observer: _____ Date: _____

SEMINAR BASIC

TOPIC:

Evaluation by staff								
Clarity of presentation								
Contents of presentation								
Understanding of subject								
Completeness of presentation								
Extent of cross referrences								
Other relevant publications								
Answering questioning on subject								
Time scheduling								
Audio-visual aids								
Over all performance								
TOTAL								

Check List-II.

MODEL CHECK-LIST FOR EVALUATION OF SEMINAR PRESENTATIONS

Name of the Student: _____

Name of the Faculty/Observer: _____ Date: _____

SEMINAR ADVANCED

Evaluation by staff								
Clarity of presentation								
Contents of presentation								
Understanding of subject								
Completeness of presentation								
Extent of cross references								
Other relevant publications								
Answering questioning on subject								
Time scheduling								
Audio-visual aids								
Over all performance								
Total								

Check List-III.

MODEL CHECK-LIST FOR EVALUATION OF JOURNAL PRESENTATIONS

Name of the Student: _____

Name of the Faculty/Observer: _____ Date: _____

JOURNAL CLUB

Evaluation by staff								
Clarity of presentation								
Contents of presentation								
Understanding of journal								
Extent of cross references								
Answering questioning on subject								
Time scheduling								
Audio-visual aids								
Over all performance								
TOTAL								

Check List-IV

MODEL CHECK-LIST FOR EVALUATION OF CASE PRESENTATIONS

Name of the Student: _____

Name of the Faculty/Observer: _____ Date: _____

CASE PRESENTATION

Evaluation by staff								
Brief clinical history								
Identifying the lesions								
Definitive diagnosis								
Differential diagnosis								
Defending the diagnosis								
Answering the questions								
Recent investigations For the disease								
Time scheduling								
Audio-visual aids								
Over all performance								
TOTAL								

Check List-V

MODEL CHECK-LIST FOR EVALUATION OF TEACHING SKILL PRACTICE

Name of the Student: _____

Name of the Faculty/Observer: _____ Date: _____

Sl. No.		**Strong Point**	**Weak Point**
1.	Communication of the purpose of the talk		
2.	Evokes audience interest in the subject		
3.	The introduction		
4.	The sequence of ideas		
5.	The use of practical examples and/or illustrations		
6.	Speaking style (enjoyable, monotonous, etc., specify)		
7.	Attempts audience participation		
8.	Summary of the main points at the end		
9.	Asks questions		
10.	Answers questions asked by the audience		
11.	Rapport of speaker with his audience		
12.	Effectiveness of the talk		
13.	Uses A.V. aids appropriately		

Check List-VI

MODEL CHECK LIST FOR DISSERTATION PRESENTATION

Name of the Student: _____

Name of the Faculty: _____ Date: _____

Sl. No.	Points to be considered divine	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Interest shown in selecting a topic					
2.	Appropriate review of literature					
3.	Discussion with guide & other faculty					
4.	Quality of Protocol					
5.	Preparation of proforma					
	Total Score					

Check List-VII

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE/CO-GUIDE

Name of the Student: _____

Name of the Faculty: _____ Date: _____

Sl. No.	Items for observation during presentations	Poor	Below Average	Average	Good	Very Good
1.	Periodic consultation with guide/co-guide					
2.	Regular collection of case material					
3.	Depth of analysis/discussion					
4.	Departmental presentation of findings					
5.	Quality of final output					
6.	Others					
	Total Score					

Check List-VIII

Model Checklists for Assessment of Scientific Papers for Publication

Sl. No.	Criteria	Distribution of Marks	Marks awarded
1.	Originality	10	
2.	Clarity & Quality of presentation	10	
3.	Relevance	10	
4.	Review of Literature	10	
5.	Quantum of works involved	15	
6.	Methodology, Sensitivity, Sample size, controlled, not Controlled study etc.,	25	
7.	Advancement of knowledge	10	
	Total	90	

Signature of the Evaluator _ _ __ _ _ _ _ _ _ _ _ _ _ _ _

Name __ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Designation _ _ _ __ __ _ _ _ _ _ _ _ _ _

Annexure I

Postgraduate Students Appraisal Form

Pre / Para /Clinical Disciplines

Name of the Department/Unit:

Name of the PG Student:

Period of Training: FROM……TO……

Sr No	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	
		1 2 3	4 5 6		7 8 9
1	Journal based / recent advances learning				
2	Patient based /Laboratory or Skill/ based learning				
3	. Self directed learning and teaching				
4	Departmental and interdepartmental learning activity				
5	External and Outreach Activities / CMEs				
6	Thesis / Research work				
7	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____

_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE SIGNATURE OF CONSULTANT SIGNATURE OF HOD

LOG BOOK

Table 1: **Academic activities attended**

Name: _____ Admission Year: _____

College: BLDE UNIVERSTY'S SHRI: B.M.PATIL MEDICAL COLLEGE, BIJAPUR-586103

Date	**Type of Activity** **Specify Seminar, Journal Club, Presentation, UG teaching**	**Particulars**

LOG BOOK

Table: 2: **Academic presentations made by the student**

Name: _____ Admission Year: _____

College: BLDE UNIVERSITY'S SHRI: B.M.PATIL MEDICAL COLLEGE, BIJAPUR-586103

Date	Topic	Type of Presentation Specify Seminar, Journal Club, Presentation, UG teaching etc.

LOG BOOK

Table 3: **Procedures performed**

Name: _____ Admission Year: _____

College: BLDE UNIVERSITY'S SHRI: B.M.PATIL MEDICAL COLLEGE, BIJAPUR-586103

Date	Name	ID No.	Procedure	Category O, A, PA, PI*

*** Key**

0 - Observed

A - Assisted a senior consultant

PA - Performed procedure under the direct supervision of a senior consultant.

PI - performed independently.

LOG BOOK

Table – 4: Daily activities record

Name: Admission year:

College;

Date	Activities	Sign

Model Overall Assessment Sheet

Name of the College: BLDE UNIVERSITY'S SHRI: B.M.PATIL MEDICAL COLLEGE, VIJAYAPUR-586103

Academic Year: _____

Sl. No.	Faculty Member & Others	Name of Student and Mean Score									
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	J
1											
2											
3											
4											
5											
Total Score											

Note: Use separate sheet for each year

SECTION - IV

MEDICAL ETHICS & MEDICAL EDUCATION

Sensitization and Practice

Introduction

There is now a shift from the traditional individual patient, doctor relationship, and medical care. With the advances in science and technology and the needs of patient, their families and the community, there is an increased concern with the health of society. There is a shift to greater accountability to the society. Doctors and health professionals are confronted with many ethical problems. It is, therefore necessary to be prepared to deal with these problems. To accomplish the Goal (i), General Objectives (ii) stated in Chapter II (pages 2.1 to 2.3), and develop human values it is urged that **ethical sensitization** be achieved by lectures or discussion on ethical issues, clinical case discussion of cases with an important ethical component and by including ethical aspects in discussion in all case presentations, bedside rounds and academic postgraduate programs.

Course Contents

1. Introduction to Medical Ethics

   What is Ethics?
   What are values and norms?
   Relationship between being ethical and human fulfillment
   How to form a value system in one's personal and professional life
   Heteronymous Ethics and Autonomous Ethics
   Freedom and personal Responsibility

2. Definition of Medical Ethics
   Difference between medical ethics and bio-ethics
   Major Principles of Medical Ethics 0
   Beneficence = fraternity
   Justice = equality
   Self determination (autonomy) = liberty

3. Perspective of Medical Ethics
   The Hippocratic Oath
   The Declaration of Helsinki
   The WHO Declaration of Geneva
   International code of Medical Ethics (1993)
   Medical Council of India Code of Ethics

4. Ethics of the Individual
   The patient as a person
   The Right to be respected
   Truth and confidentiality
   The autonomy of decision
   The concept of disease, health and healing
   The Right to health
   Ethics of Behavior modification
   The Physician-Patient relationship
   Organ donation

5. The Ethics of Human life
   What is human life?
   Criteria for distinguishing the human and the non-human
   Reasons for respecting human life
   The beginning of human life
   Conception, contraception
   Abortion
   Prenatal sex-determination
   In vitro fertilization (IVF), Artificial Insemination by Husband (AIH)
   Artificial Insemination by Donor (AID)
   Surrogate motherhood, Semen Intra fallopian Transfer (SIFT),
   Gamete Intra fallopian Transfer (GIFT), Zygote Intra fallopian Transfer (ZIFT),
   Genetic Engineering

6. The family and society in Medical Ethics
   The Ethics of human sexuality
   Family Planning perspectives
   Prolongation of life
   Advanced life directives – The Living Will
   Euthanasia
   Cancer and Terminal Care

7. Profession Ethics
   Code of conduct
   Contract and confidentiality
   Charging of fees, Fee-splitting
   Prescription of drugs
   Over-investigating the patient
   Low – Cost drugs, vitamins and tonics
   Allocation of resources in health cares

Malpractice and Negligence

8. Research Ethics
   Animal and experimental research / humanness
   Human experimentation
   Human volunteer research – Informed Consent
   Drug trials\
   ICMR Guidelines for Ethical Conduct of Research – Human and Animal
   ICH / GCP Guidelines
   Schedule Y of the Drugs and Cosmetics Act.

9. Ethical work -up of cases
   Gathering all scientific factors
   Gathering all human factors
   Gathering value factors
   Identifying areas of value – conflict, setting of priorities,
   Working our criteria towards decisions

Recommended Reading

1. Francis C. M., **Medical Ethics**, 2nd Ed, 2004Jaypee Brothers, Bangalore/-
2. Ethical guidelines for biomedical research on human participants, ICMR publication 2017
3. Santosh Kumar: the elements of research, writing and editing 1994, Dept of Urology, JIPMER, Pondicherry
4. Srinivas D.K etal, Medical Education Principles and Practice, 1995, National Teacher Training Centre, JIPMER, Pondicherry
5. Indian National Science Academy, Guidelines for care and use of animals in scientific Research, New Delhi, 1994
6. International committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl G Med 1991
7. Kirkwood B.R, Essentials of Medical Statistics, 1st Ed.,Oxford: Blackwell Scientific Publications 1998
8. Mahajan B.K. Methods in bio statistics for medical students, 5th Ed, New Delhi, Jaypee, Brothers Medical Publishers, 1989
9. Raveendran, B. Gitanjali: A Practical approach to PG dissertation, New Delhi, Jaypee Publications, 1998.
10. John A Dent. Ronald M Harden, A Practical guide for medical teacher, 4th Edition, Churchill Livingstone, 2009.
11. Tejinder Singh Anshu, Principles of Assessment in Medical Education, Jaypee brothers
12. Dr. K.Lakshman, A Hand Book on Patient Safety, RGUHS & Association of Medical Consultants, 2012

13. Bernard Mogs, Communication skills in health & social care, 3rd Edition, (S) SAGE, 2015
14. Manoj Sharma, R. Lingyak Petosa, Measurement and Evalution for Health Educators, Jones & Bartlett Learning.
15. David E. Kern, Particia A, Thomas Mark T, Hughes, Curriculum Development for Medical Education. A six-step approach, The Johns Hopkins University press/Baltimore.
16. Tejinder Singh Piyush Gupta Daljit Singh, Principles of Medical Education (Indian Academy of Paediatrics), 4th Edition, Jaypee Brothers, 2013.
17. Robert Reid, Torri Ortiz Linenemann, Jessica L.Hagaman, Strategy Instruction for Students with learning disabilities, 2nd Edition, The Guilford Press London.
18. Lucinda Becker Pan Demicolo, Teaching in higher education, (S) SAGE, 2013.
19. C.N. Prabhakara, Essential Medical Education (Teachers Training), Mehta publishers.
20. Tejinder Singh Piyush Gupta, Principles of Evaluation & Research for health care programmes, 4th Edition, IAP National Publication House (Jaypee Brothers).
21. R.L.Bijlani, Medical Research, Jaypee Brothers, 2008
22. Stephen Polgar Shane A Thomas, Introduction to Research in the Health Sciences, Churchill Livingstone Elsevier, 2013.
23. Amar A,Sholapurkar. Publish & Flourish -A practical guide for effective scientific writing, Jaypee Brothers, 2011
24. Charles R.K.Hind, Communication Skills in Medicine, BMJ, 1997.

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