Regulations and Curricula
for
Post Graduate Degree and Diploma Courses
in
Medical Sciences

2000

Volume III: Clinical Subjects

M. D. Radiotherapy

Rajiv Gandhi University of Health Sciences, Karnataka
4th 'T' Block, Jayanagar, Bangalore - 560 041

Regulations for Post Graduate Degree and Diploma Courses in Medical Sciences
(Annexure to University Notification No. UA/ORD-6/99-2000 dated 01.01.2000)

Contents

Rajiv Gandhi University of Health Sciences, Karnataka

4th T Block, Jayanagar, Bangalore - 560 041

No. UA/ORD-06/1999-2000 **01.01.2000**

NOTIFICATION

Sub: Revised Ordinances pertaining to Post Graduate Degree, Diploma and Super Speciality Courses in Medicine

Ref: Minutes of the 16th syndicate meeting held on 16.11.1999.

In exercise of the powers conferred under Sec. 35(2) of the RGUHS Act, the Syndicate at its meeting held on 16.11.1999 has been pleased to approve the Revised Ordinances pertaining to Post Graduate Degree, Diploma and Super Speciality Courses in Medicine as given in schedule here to annexed.

The Revised Ordinances as above shall come into force immediately and is applicable for University examination of March 2000 and onwards.

By order,
Sd/
REGISTRAR

To

1. The Principals of all Medical Colleges affiliated to RGUHS
2. The Members of the Syndicate/Senate/Academic Council.

Rajiv Gandhi University of Health Sciences, Karnataka

4th T Block, Jayanagar, Bangalore - 560 041

No. UA/ORD-06/1999-2000 **26.12.2000**

NOTIFICATION

Sub: Revised Ordinance pertaining to PG Degree, Diploma and Super Specialty Courses in Medicine

Read: The Revised Ordinance along with Syllabus and Scheme of Examination of Pre-clinical and Para-clinical subjects pertaining to Postgraduate Degree, Diploma and Super Sociality courses in Medicine as approved by the Syndicate at its meeting held on 16.11.1999 and notified in the University notification No. UA/ORD-6/1999-2000 dt. 01.01.2000. Now the Syndicate at its meeting held on 22.11.2000 has approved Syllabus of Postgraduate Clinical Subjects and the same is notified.

In exercise of the powers conferred under Sec. 35(2) of the RGUHS Act, the Syndicate has been pleased to approve the Curriculum (Syllabus) of following PG Clinical Subjects in respect of above ordinance as given in the schedule here to annexed.

Subject	Degree	Diploma
Anesthesiology	1. M.D.	2. D.A.
Aviation Medicine	3. M.D.	---
Dermatology, Venereology and Leprosy	4. M.D.	5. DDVL
General Medicine	6. M.D.	----
General Surgery	7. M.S.	----
Obstetrics & Gynecology	8. M.S.	9. DGO
Oto-Rhino-Laryngology	10. M.S.	11. DLO
Ophthalmology	12. M.S.	13. DO
Orthopedics	14. M.S.	15. D. Ortho
Pediatrics	16. M.D.	17. DCH
Psychiatry	18. M.D.	19. DPM
Radio-Diagnosis	20. M.D.	21. DMRD
Radiotherapy	22. M.D.	23. DMRT
Tuberculosis & Respiratory Medicine	24. M.D.	25. DTCD

The Syllabus as above shall be applicable from the Academic Year 2000-01.

By order,
Sd/
REGISTRAR

To

1. The Principals of all Medical Colleges affiliated to RGUHS
2. The Members of the Syndicate/Senate/Academic Council.

Rajiv Gandhi University of Health Sciences, Karnataka, Bangalore.

Regulations for Post Graduate Degree and Diploma Courses in Medical Sciences

Chapter I

1. Branches of Study

1.1 Postgraduate Degree Courses

The following courses of studies may be pursued.

A. *M.D. (Doctor of Medicine)*

1. Anaesthesiology
2. Aviation Medicine
3. Anatomy
4. Biochemistry
5. Community Medicine
6. Dermatology, Venereology and Leprosy
7. Forensic Medicine
8. General Medicine
9. Microbiology
10. Pathology
11. Paediatrics
12. Pharmacology
13. Physiology
14. Psychiatry
15. Radio-diagnosis
16. Radio-threapy
17. Tuberculosis & Respiratory Medicine

and such other subjects as might have been introduced by the Universities in Karnataka prior to commencement of Health University i.e., 1.6.1996, or recognised by Medical Council of India.

B. M.S. (Master of Surgery)

1. General Surgery
2. Obstetrics and Gynecology
3. Ophthalmology
4. Orthopedics
5. Oto-Rhino-Laryngology

and such other subjects as might have been introduced by the Universities in Karnataka prior to commencement of Health University i.e., 1.6.1996, or recognised by Medical Council of India.

C. D.M. (Doctor of Medicine)

1. Cardiology and such subjects recognised by Medical Council of India.

D. M.Ch (Master of Chirurgie)

In the subjects recognised by Medical Council of India.

1.2 Postgraduate Diploma Courses

Post graduate diploma course may be pursued in the following subjects:

Child Health (D.C.H.), Obstetrics and Gynaecology (D.G.O.), Otorhinolaryngology (D.L.O.), Ophthalmology (D.O.), Orthopaedics (D.Ortho), Anaesthesiology (D.A.), Clinical Pathology (D.C.P.), Microbiology (D. Micro), Public Health (D.P.H), Forensic Medicine (D.F.M.), Dermatology, Venerology and Leprosy (D.D.V.L.), Psychiatry (D.P.M.), Radio-Diagnosis (DMRD), Radio-therapy (DMRT), Tuberculosis and Chest Diseases (D.T.C.D.) and such other subjects as might have been introduced by the Universities in Karnataka prior to commencement of Health University i.e., 1-6-1996, and recognised by Medical Council of India.

2. Eligibility for Admission

2.1 MD / MS Degree and Diploma Courses: A candidate affiliated to this university and who has passed final year M.B.B.S. examination after pursuing a study in a medical college recognised by the Medical Council of India, from a recognised Medical College affiliated to any other University recognised as equivalent thereto, and has completed one year compulsory rotating internship in a teaching Institution or other Institution recognised by the Medical Council of India, and has obtained permanent registration of any State Medical Council shall be eligible for admission.

2.2 D.M and M.Ch Courses:

D.M.: Candidate seeking admission for D.M courses in any subject must posses recognised degree of MD (or its equivalent recognised degree) in the subject specified in the regulations of the Medical Council of India from time to time.

M.Ch : Candidate seeking admission for M.Ch course in any subject must posses recognised degree of MS (or its equivalent recognised degree) in the subject specified in the regulations of the Medical Council of India from time to time.

3. Obtaining Eligibility Certificate by the University before making Admission

No candidate shall be admitted for any postgraduate degree/diploma course unless the candidate has obtained and produced the eligibility certificate issued 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 recognised for internship.

7. Registration by any State Medical Council and
8. Proof of SC/ ST or Category I, as the case may be.

Candidates should obtain the Eligibility Certificate before the last date for admission as notified by the University.

A candidate who has been admitted to postgraduate course should register his / her name in the University within a month of admission after paying the registration fee.

4. Intake of Students

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

5. Duration of Study

a) M.D /M.S Degree Courses

The course of study shall be for a period of 3 years consisting of 6 terms.

b) D.M /M.Ch

The courses of study shall be for a period of 3 years consisting of 6 terms.

c) Diploma courses:

The course of study shall be for a period of 2 years consisting of 4 terms.

5.2 Requirement to complete the course -- **deleted ***

6. Method of training

The training of postgraduate for degree/diploma shall be residency pattern 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 programme 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. Similarly, clinical subjects' students should be posted to basic medical sciences and allied speciality departments or institutions.

7. Attendance, Progress and Conduct

7.1 A candidate pursuing degree/diploma 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.

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

7.3 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.

* deleted vide university notification No. UA/ORD-6/1999-2000 dated 9.4.2001

7.4 Every candidate is required to attend a minimum of 80% of the training during each academic year of the post graduate course. 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.

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

8. Monitoring Progress of Studies:

8. Monitoring Progress of Studies:

8.1 Work diary / Log Book - Every candidate shall maintain a work diary and record of his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. (please see Chapter IV for model checklists and logbook specimen copy). 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. The work diary shall be scrutinised and certified by the Head of the Department and Head of the Institution, and presented in the university practical/clinical examination.

8.2 Periodic tests:

Incase of degree courses of three years duration (MD/MS, DM, MCh.), 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, practicals / clinicals and viva voce. Records and marks obtained in such tests will be maintained by the Head of the Department and sent to the University, when called for.

In case of diploma courses of two years duration, the concerned departments may conduct two tests, one of them be at the end of first year and the other in the second year three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

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

9. Dissertation

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

9.2 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, comparison of results and drawing conclusions.

9.3 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.

9.4 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.

9.5 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
x. Tables
xi. Annexures

9.6 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 (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.

9.7 Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.

9.8 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.

9.9 **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. 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 recognised 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 recognised for teaching/training by Rajiv Gandhi University of Health Sciences/Medical Council of India. The co-guide shall be a recognised post graduate teacher of Rajiv Gandhi University of Health Sciences.

9.10 **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.

10. Schedule of Examination

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

11. Scheme of Examination

11.1 M.D. / M.S. Degree

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

11.1.1 Dissertation: Every candidate shall carryout work and submit a dissertation as indicated in Sl.NO.9. Acceptance of dissertation shall be a precondition for the candidate to appear for the final examination.

11.1.2 Written Examination (Theory): A 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.

11.1.3 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.

The total marks for practical / clinical examination shall be 200.

11.1.4 Viva Voce: Viva Voce Examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 100 and the distribution of marks shall be as under:

(i) For examination of all components of syllabus	80 Marks
(ii) For Pedagogy	20 Marks

11.1.5 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.

11.1.6 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 viva voce examination.

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 Registrar (Evaluation).

11.1.7 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 marks is 75 percent and above. Distinction will not be awarded for candidates passing the examination in more than one attempt.

11.2 D.M / M.Ch:

The examination shall consist of theory, clinical/practical and viva voce examination.

11.2.1 (Theory) (Written Examination): The theory examination shall consist of **four** question papers, each of **three** hours duration. Each paper shall carry 100 marks. Out of the **four** papers, the first paper will be on basic medical sciences. Recent advances may be asked in any or all the papers.

11.2.2 Practical / Clinical Examination:

In case of practical examination it should be aimed at assessing competence, skills of techniques and procedures as well as testing students ability to make relevant and valid observations, interpretence and experimental work relevant 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.

The maximum marks for Practical / Clinical shall be 200.

11.2.3 Viva Voce: Viva Voce examination shall aim at assessing thoroughly depth of knowledge, logical reasoning, confidence and oral communication skills. The maximum marks shall be 100.

11.2.4 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.

11.2.5 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 viva voce examination.

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 Registrar (Evaluation).

11.3 Diploma Examination:

Diploma examination in any subject shall consist of theory (written papers), Practical / Clinical and Viva - Voce.

11.3.1 Theory: There shall be **three** written question papers each carrying 100 marks. Each paper will be of **three** hours duration. In clinical subjects one paper out of this shall be on basic medical sciences. In basic medical subjects and para clinical subjects, questions on applied clinical aspects should also be asked.

11.3.2 Practical / Clinical Examination:

In case of practical examination it should be aimed at assessing competence, skills related to laboratory procedures as well as testing students ability to make relevant and valid observations, interpretation of laboratory or experimental work relevant 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 atleast one long case and two short cases.

The maximum marks for practical / Clinical shall be 150.

11.3.3 Viva Voce Examination: Viva Voce examination should aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 50.

11.3.4 Criteria for Pass: 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 viva voce examination.

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 Registrar (Evaluation).

11. 3.5 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 marks is 75 percent and above. Distinction will not be awarded for candidates passing the examination in more than one attempt.

11.3.6 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.

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

MD / MS Course: Maximum of 6 per day
Diploma Course: Maximum of 8 per day
DM / M.Ch Course: Maximum of 3 per day

CHAPTER II

GOALS AND GENERAL OBJECTIVES OF POSTGRADUATE MEDICAL EDUCATION PROGRAM

GOAL

The goal of postgraduate medical education shall be to produce competent specialist and /or Medical teacher:

(i) who shall recognise 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) Recognise the importance of the concerned speciality in the context of the health need of the community and the national priorities in the health sector.

ii) Practice the speciality concerned ethically and in step with 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, rehabilitative, preventive and promotive 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 specialty.

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

viii) Demonstrate empty and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.

ix) Play the assigned role in the implementation of national health programmes, effectively and responsibly.

x) Organise 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, recognise continuing educational needs; select and use appropriate learning resources.

xii) Demonstrate competence in basic concepts 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 health team engaged in health care, research or training.

STATEMENT OF THE COMPETENCIES

Keeping in view the general objectives of postgraduate training, each disciplines 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 programme 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 Thesis.
- Attitudes, including communication.
- Training in research methodology.

Source: Medical Council of India, Regulations on postgraduate medical education, 1997.

Chapter III

Course Description

M. D. RADIO THERAPY

Goals:

Radiation Oncology is a clinical and scientific discipline devoted to management of patients with cancer and other disease by ionizing radiation, alone or combined with other modalities like Surgery and Chemotherapy.

At the end of the training program the candidate should have acquired sufficient expertise and in-depth knowledge in the field of Oncology, Basic and Radiological Physics, Radiobiology, Etiology, Pathology, Epidemiology and Statistics related to malignant diseases and the investigations commonly used like Radiology and Laboratory methods, practice of Clinical Oncology with special reference to Radiation Oncology and Chemotherapy, management of Oncologic Emergencies and side effects of Cancer management. The candidate should have good knowledge of Cancer Prevention, early detection, rehabilitation and emotional problems and the recent advances in Oncology. He/she should exercise empathy and a caring attitude and maintain high ethical standards; continue to evince keen interest in continuing education irrespective of whether he/she is in a teaching institution or is a practicing specialist; and be a motivated 'teacher' – defined as a specialist keen to share his / her knowledge and skills with a colleague or a junior or any learner.

Objectives

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. *Human values, Ethical practice and Communication abilities*

Knowledge:

- Describe aetoiology, pathophysiology, principles of diagnosis and management of common problems including emergencies, in adults and children.
- Demonstrate understanding of basic sciences relevant to this speciality
- Describe common malignancies in the country and their management including prevention
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapuetic measures.
- Advise regarding the operative or non-operative management of the case and to carry out this management effectively.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.
- Update oneself by self study and by attending courses, conferences and seminars relevant to the speciality.
- Teach and guide his team, colleagues and other students.

- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the surgical condition.
- Perform common procedures relevant to the specialitay.
- Provide basic and advanced life saving support services (BLS & ALS) in emergency situations
- Undertake complete monitoring of the patient.

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

A. Radiation Therapy Physics

Principles of Radiological Physics, Dosimetry, and Treatment Planning
Physics and Dosimetry of High & Low Dose-Rate Brachytherapy

General Physics

- I Matter and Energy, Radiation and Spectra,
- II Atoms and Nuclei.
- III Radioactivity.
- Radioactivity – Materials,
- The Production of X-Rays,
- The Interaction of X- And Gamma Rays with Matter-I,
- The Interaction of X- and Gamma Rays with Matter-II,
- The Effects of X-Rays,
- The Measurement of X-Ray Quantity,
- The Roentgen and ITS Measurement,
- The Geiger-Muller and Scintillation Counters and the Thermoluminescence Dosemeter,
- Absorbed Dose and the Rad,
- Filters and Filtration.

Physics Applied To Radiotherapy

- The Physical Principles of Radiotherapy,
- Teletherapy Dosage Data: General Considerations,
- Teletherapy Dosage data for Clinical Use,
- Out put M4easurements and the use of Isodose charts,

- Patients dosage,
- Beam Modification,
- Collimtors and Bream-Direction Devices,
- The treatment prescription,
- Some special techniques,
- Teletherapy Sources,
- Acceptance tests and Calibration,
- Gamma-Ray Sources for Plesiotherapy,
- Plesiotherapy Dosage Calculations,
- Particle Radiations in Radiotherapy

Radiation Protection

- General Principles and Materials,
- Departmental Protection,
- Protection Instrument and Personnel Monitoring.

B. Radiation Biology:

1. The Physics and Chemistry of Radiation Absorption
2. DNA Strand Breaks and Chromosomal Aberrations
3. Cell Survival Curves
4. Dose-Response Relationships for Normal Tissues
5. Model Tumor Systems
6. Radiosensitivity and Cell age in the Mitotic cycle
7. Repair of Radiation damage and the Dose-Rate Effect.
8. The oxygen Effect and Reoxygenation.
9. Linear Energy Transfer and Relative Biological Effectiveness.
10. Radiosensitizers and Bioreductive Drugs.
11. Radioprotectors.
12. Cell, Tissue, and Tumor kinetics.
13. Time, Dos and Fractionation in Radiotherapy
14. New Radiation Modalities.
15. Predictive Assays.
16. Hyperthermia
17. Chemotherapeutic agents from the perspective of the Radiation Biologist.
18. Acute Effects of Total-Body Irradiation
19. Radiation Carcinogenesis.
20. Hereditary Effects of Radiation.
21. Effects of Radiation on the Embryo and Fetus.
22. Radiation Cataractogenesis.
23. Molecular Techniques in Radiobiology
24. Diagnostic Radiology and Nuclear Medicine.
25. Radiation Protection.

C. Basic Sciences

1. Pathology of Benign and Malignant Diseases
   A. Principles and methods of definite diagnosis, Surgical biopsy, Exfoliative Cytology, Fine needles aspiration cytology and biopsy
   B. General histologic and cytologic features and mlignancy

C. Classification of benign and malignant tumors and their interpretation.
D. Methods of dissemination of cancer and its biological behaviors.
E. Degree of differentiation of cancer.
F. Radiation pathology.

2. Applied Anatomy and Physiology.
   A. Anatomy or oral cavity, larynx, pharynx, paranasal sinuses, CSF pathways salivary glands, middle ear, external orbit, breast, bronchopulmonary segments, mediastinum, oesophagus, liver, spleen, small and large bowels, pelvic and genito-urinary organs (bladder, uterus, ovary, testis rectum, anal canal etc).

   B. Lumphatic system and drainage,

   C. Relationship of vital structures,

   D. General principles of physiology of respiratory, cardiovascular, nervous and biliary systems.

3. Various investigative and imaging Procedures in Diagnosis, Staging, Management and Follow-up of cancer.

D. Bio-statistics

1. Sampling – Random sampling, purposive sampling, advantages of sampling, Various methods of sampling (Simple random, systematic, stratified, cluster, Multistage & multiphase), sampling error, non-sampling error.

2. Descriptive statistics – Arithmetic mean, Median, Mode, and Standard error, coefficient of variation.

3. Graphics presentation of date – Bar diagram, histogram frequency curve, line graph, pie chart.

4. Normal distribution – Definition and properties/Confidence interval, Basic concept of testing of hypothesis, p-value, power of the test.

5. Test of significance –t-test, test of proportion, chi-square test, concept of analysis of variance.

6. Study design – Descriptive studies, analytical studies. Observational studies, experimental studies, prospective studies, retrospective studies, odds ration, relative risk, attributable risk percent, population attributable risk percent.

7. Correlation and regression – Simple correlation, linear regression, concept of multiple regression.

8. Survival analysis – Life table, Survival analysis, K – M Method, Cox regression, log ran k test.

9. Sample size determination – Basic concept, sample size determination of estimating proportion and mean.

10. Clinical trials in cancer research – Basic concept.

E. Principles of Oncology

1. Molecular Biology of cancer: oncogene, Gytogenetics, The Cell Cycle, Invasion and Metastasis
2. Etiology of Cancer: Viruses, Chemical Factors, Physical Factors, Hormonal Factors
3. Epidemiology of Cancer:
4. Principles of Cancer Management: Molecular pathology, cancer Genetics,
5. Principles of Surgical Oncology
6. Principles of Chemotherapy
7. Principle of Biology Therapy,
8. Cancer Drug Discovery and Development, Mechanisms of Drug Resistance,
9. Clinical Trails in Cancer
10. Cancer Prevention: Preventing Tobacco – Related Cancers, Diet and Risk Reduction, Chemopreventive Agents, Hormones,
11. Cancer Screening,
12. Imaging Techniques in Cancer Management: Computer Tomography, Magnetic Resonance Imaging, Radionuclide Imaging, Ultrasound, Functional and Metabolic Imaging, Interventional Radiology, Endoscopy, Laparoscopy,
13. Vascular Access and Specialized Techniques of Drug Delivery
14. Paraneoplastic Syndromes

F. Principles of Radiation Oncology

1. Biologic Basis of Radiation therapy
2. Altered Fractionation Schedules
3. Morphology of Radiation Effects on Normal Tissues
4. Late Effects of Cancer Treatment: Radiation and Drug Toxicity
5. Staging and Classification of the Cancer and the Host: A unified Approach verus Methodology of Clinical Trials
6. Chemical Modifiers of Radiation, Chemotherapy and Irradiation
7. Clinical Applications of Electron Beam Therapy
8. Total Body and Hemibody Irradiation
9. Three-Dimensional Conformal Radiation Therapy: Clinical Aspects
10. Particle Beam Radiation Therapy: Clinical Applications
11. Radioimmunogolobulins in Cancer Therapy

Radiotherapy – External/Brachytherapy: Indication, Rationale, Preparation of the patient techniques, dose, volume, times, fractionation, Simulations, reduplication of treatment, Procedure, results, response, survival, complication, management of Radiotherapy complication follow-up and summary.

G. Principles and Practice of Radiotherapy and Oncology

GROUP A:

Skin, Classic and Acquired Immunodeficiency Syndrome (AIDS)-Related Kaposi's Sarcoma, Cutaneous T-Cell Lymphoma, Brain, Pituitary, Spinal Canal, Eye, Ear, Nasopharynx, Nasal Cavity and Paranasal Sinuses, Salivary Glands, Oral Cavity, Tonsillar Fossa and Faucial Arch, Base of Tongue, Hypopharynx, Larynx, Unusual Nonepithelial Tumors of the Head and Neck, Head and Neck: Management of the Neck

GROUP B:

Thyroid. Lung, Mediastinum and Trachea, Esophagus, Heart and Blood Vessels, Breast: Stage Tis, T1 and T2 Tumors, Breast: Locally Advanced (T3 and T4) and Recurrent Tumors, Pancreas and Hepatobiliary Tract, Colon and Rectum, Anal Canal, Kidney, Renal Pelvis, and Ureter, Bladder, Female Urethra, Prostate, Testis, Penis and Male Urethra,

GROUP C:

Uterine Cervix, Endometrium, Ovary, Fallopian Tube, Vagina, Vulva, Retroperitoneum, Adrenal Gland, Hodgkin's Disease, Non-Hodgkin's Lymphomas, Multiple Myeloma and Plasmacytomas, leukemias, Bone, Soft Tissue Sarcomas (Excluding Retroperitoneum, Pediatric Tumors: An Overview, Brain Tumors in Children, Wilms' Tumor, Neuroblastoma, Rhabdomyosarcoma, Lymphomas in Children, Radiation Treatment of Benign Disease, Pain Management, Supportive Care and quality of life in Radiation Oncology

GROUP D:

Oncologic Emergencies: Superior Vena Cava Syndrome, Spinal Cord Compression, Metabolic Emergencies, Surgical Emergencies, Urologic Emergencies,
Treatment of Metastatic Cancer: Brain, Lung, Liver, Bone, Malignant Pleural and Pericardial Effusions, Malignant Ascites
Infections in the Cancer Patients
Adverse Effects of Treatment: Nausea and Vomiting, Oral complications, Cystitis, Pulmonary Toxicity, Csardiac Toxicity, Hair Loss, Gonadal Dysfunction, Second Cancers, Miscellaneous Toxicities,
Supportive Care and Quality of Life:
Management of Cancer Pain, Nutritional Support, Sexual Problems, Genetic Counseling,
Physchologic Issues, Specialized care of the Terminally ill, Approaches to Meeting the Needs of the Dying Patient, Rehabilitation of the Cancer Patient

H. Newer Approaches to Cancer Treatment:
Gene Therapy, Cancer Vaccines, Immunotoxin Therapy, Antisense Inhibition of Gene Expression, Antiangiogenic Therapy, Radiation and Chemotherapy Protectors, Intensity Modulation of the Radiation Beam, Fractionated (Relocatable) Stereotactic Radiotherapy, Molecular Targets for Drug Development.

Quality Assurance, Recent Advances in Radiation Therapy, Altered Fractionation, Biologic Modeling and Plan Evaluation, Conformal Therapy, Proton Therapy, Neutron Brachytherapy, Neutron Capture Therapy, Neutron Beam Therapy, Heavy Ion and Pion Therapy, Physics of High Linear Energy Transfer (LET) Particles and Protons, Intra-operative Radiation Therapy, Hyperthermia, Three-Dimensional Physics and Treatment Planning, Stereotactic Irradiation

Teaching and Learning Activities
A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. 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 himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire 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 post graduate students of all specialties. Few topics are suggested as examples:
        1) Bio-statistics
        2) Use of library,
        3) Research Methods
        4) Medical code of Conduct and Medical Ethics
        5) National Health and Disease Control Programmes
        6) Communication Skills etc.

    These topics may preferably taken up in the first few weeks of the 1st year.
    b) Subject related Lectures: By Specialists in pathology, Radiation Physics, Radiobiology, Chemotherapy and Radiation Oncology.
    c) Integrated Lectures: These are recommended to be taken by multidisciplinary teams for selected topics, eg. 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 Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See checklist in Chapter IV). A time table with names of the student 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 Log Book 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 check lists and would carry weightage for internal assessment (See checklist in Chapter IV). 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. Ward Rounds: Ward rounds may be service or teaching rounds.
    a) Service Rounds: Postgraduate students and Interns should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.

    b) Teaching Rounds : Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.

    Entries of (a) and (b) should be made in the Log book.

6. Clinical Case Presentations: Minimum of 5 cases to be presented by every candidate each year. They should be assessed using check lists and entries made in the log book
7. Clinico-Pathological Conference: Recommended once a month for all post graduate students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.

8. Inter Departmental Meetings: Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

   Pathology: A dozen interesting cases may be chosen and presented by the post graduate students and discussed by them as well as the senior staff of Surgery department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advance immuno-histo-chemical techniques, the burgeoning markers other recent developments can be discussed.

   Radio-diagnosis: Interesting cases and the imaging modalities should be discussed.

9. Teaching Skills: : Post graduate students must teach under graduate students (Eg. medical, nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by surgery faculty as well students. (See model check list in Chapter IV). Record of their participation be kept in Log book. Training of post graduate students in Educational Science and Technology is recommended.

10. Continuing Medical Education Programmes (CME) : Recommended that at least 2 state level CME programmes should be attended by each student in 3 years.

11. Conferences: Attending conferences is optional. However it is encouraged.

Dissertation

1. Every candidate pursuing degree course is required to carry out work on a selected research project under the guidance of a recognised 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, comparison of results and drawing conclusions.

3. Every candidate shall submit to the Registrar (Academic), RGUHS, 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 registered by the University. 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 (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.

7. Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), 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.

9. For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Graded Responsibility in Cane of Pastients and Operative work (Structured Training Schedule)

I Year : Participation in OPD work, Observation in Treatment planning and execution and ward card helping the consultant in in-patient care.

II Year: Participation in OPD, Treatment planning and execution under supervision of consultant & inpatient care.

III Year. Independent assessment, execution of treatment decision allowed but cross checked by the consultant before execution. Participation in teaching and research activities and in-patient care.

Rotation Posting

MD Students shall be posted to other relevant departments or other centers with better and latest equipment's for a minimum period of 3 to 6 months, for completion of training in Medical and Surgical Oncology and for learning recent advances in the specialty. The student on completion of the training shall submit a report duly signed by the concerned department to the HOD Radiotherapy.

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

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:

- Caring attitudes
- Initiative
- Organisational 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 (see Model Checklist – I, Chapter IV)

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 (see Model Checklist-II, Chapter IV)

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.

iii) 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 (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

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. (Table No.3, Chapter IV)

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 (See Model checklist V, Chapter IV)

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 finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

vi) *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

Maintenance of Log Book for Academic Activities. All the Programs conducted should be entered in both the student /departmental records and countersigned by respective Teaching Faculty documenting the completion of assigned task.

Record Books of Bed Side clinics, Seminars and Journals presented with copies of the presentation duly corrected and signed by a teacher with comments are to be maintained by the student and submitted to the Head of the Department periodically and at the end of the course.

The Record books maintained by the student should be submitted to the Head of the Department 6 months prior to completion of the course and the Head of the Department makes a certification of the Academic Progress. An assessment of student performance through out the said course shall be made by the HOD and communicated to the University.

The log book is a record of the important activities of the candidates during his training, Internal assessment should be based on the evaluation of the log book. Collectively, log books 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.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

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:

A. Theory (Written Paper) 400 marks

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 : Applied Anatomy, Pathology, Radiation Physics, Radio biology.

Paper II : Principles and Practice of Chemotherapy in Malignant Diseases, Preventive Oncology, Palliative Care.

Paper III : General Principles of Radiotherapy and Oncology. Principles and Practice of Radiotherapy of skin, head & neck, central and peripheral nervous system and GI tract tumors.

Paper IV : Principle and Practice of Radiotherapy of thoracic region, including breast, genito urinary system, lymphoretichlar system, musculo- skeletal system and pediatric tumors.

B. Clinical : 200 marks

One Long case - 80 marks
Three Short cases - 40 marks each

C. Viva Voice : 100 marks

1) Viva-Voce Examination: (80 Marks)
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. In addition candidates may be also be given case reports, charts, gross specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images, for interpretation. It includes discussion on dissertation also.

2) Pedagogy Exercise: (20 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.

D.

Maximum marks for	Theory	Practical	Viva	Grand Total
M.D. degree course	400	200	100	700

Recommended Books and Journals

Books

1. **The treatment of malignant disease by Radiotherapy** by Ralston Paterson 2nd edition, 1963
2. **Principles of Practice of Radiation Oncology** by Carlos A. Parez, Luther W. Brandy (Lippincott Raven)
3. **Textbook of Radiotherapy** by Gilbert H.Fletcher
4. **Moss Radiation Oncology** 7th Edition by James D. Cox, Mosby
5. **Cancer – Principles & Practice of Oncology** by Vincent T De Vita, Samuel Hellman Steven A. Rosenberg, 5th edition. (Lippincott – Raven)
6. **Recent advances in Clinical Oncology** by C.J. Williams & JMA Whitehouse
7. **Treatment of cancer** by Pat Price, Keith Halnan, 3rd edition.
8. **The Physics of Radiation Therapy,** 2nd Edition, Fiaz M. Khan, William and Wilkins
9. **Fundamental Physics of Radiology**, 3rd Edition, Meredith and Massey, Varghese
10. **Physics of Radiology** by H.E. John's & J.R. Cunnigham, 4th edition.
11. **Clinical Oncology A multidisciplinary approach for Physicians and Students** Philip Rubin WB Saunders,
12. **Oxford Text Book of Oncology Volume – 1 and 2,** Peckham, Pinedo and Veronesi, Oxford,
13. **Clinical Oncology**, Abeloff, Armitage, Churchill and living stone,
14. **Basic Clinical Radio Biology** 2nd Edition, G. Gordon Steel Arnold
15. **Treatment planning in Radiation Oncology,** Khan, Roger A Portist William and Wilkins
16. **Radiation Therapy Physics** 2nd Edition Hende, Ibbott Mosby,
17. **Text Book of Radiation Oncology** Leible Philips, Saunders,
18. **Current Radiation Oncology,** Tobias / Thomas Arnold,
19. **Radiation Oncology Technology and Biology** Mauch / Loeffer Saunders,
20. **Paediatric Radiation Oncology** 2nd Edition, Halperin, Raven,
21. **Basic Science of Oncology,** Tannock, Hill Mc Graw Hill,
22. **Management of Head and Neck Cancer, Multidisciplinary approach** 2nd Edition Million J.B. Lippincott
23. **Principles of Radiological Physics,** Graham, Churchill Living Stone
24. **CANCER** 4th edition, Ackerman C.V. Mosby
25. **Radiobiology for the Radiologist**, Eric J. Hall, J.B. Lippincott

Journals

- **International Journal of Cancer,** UICC, Wiley Inc,
- **Genes Chromosomes and Cancer,** Wiley
- **Medical Physics,** American Association of Physicist in Medicines and Association of COMP
- **Oral Oncology:** EJC Publications
- **Seminars in Oncology -** W.B. Saunders Company,
- **Seminars in Surgical Oncology -** UICC, Wiley Less
- **Seminars in Radiation Oncology** – WB Saunders Company,
- **Cancer Detection and prevention** – International Society for Preventive Oncology,
- **ACTA Oncologica** – Scandinavian University Press,
- **International Journal of Radiation Oncology, Biology, and Physics** – Elsevier
- **Journal of Clinical Oncology** – Lippincott Williams and Wilkins
- **Journal of Surgical Oncology** – UICC, Wiley
- **Gynecologic Oncology** – Academic Press
- **British Journal of Cancer** – Church Livingstone

- **Current Opinion in Oncology** – Lippincott Williams and Wilkins, Rapid Series
- **Journal of NCI** – Oxford University Press
- **The Cancer Journal** – Jones and Bartlett
- **International Journal of Cancer: Predictive Oncology** – UICC, Wiley less
- **International Journal of Cancer : Radiation Oncology Investigations** – UICC, Wiley
- **Endocurietherapy/Hyperthermia**: Advanced Medical Publishing,
- **Radiotherapy and Oncology** – Elsevier.

ADDITIONAL READING

1. Indian Council of Medical Research, "Ethical Guidelines for Biomedical Research on Human Subjects", I.C.M.R, New Delhi, 2000.

2. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi.

3. Francis C M, Medical Ethics, J P Publications, Bangalore, 1993.

4. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi, 1994.

5. Internal National Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991; 424-8

6. Kirkwood B R, Essentials of Medical Statistics , 1st Ed., Oxford: Blackwell Scientific Publications 1988.

7. Mahajan B K, Methods in Bio statistics for medical students, 5th Ed. New Delhi, Jaypee Brothers Medical Publishers, 1989.

8. Compendium of recommendations of various committees on Health and Development (1943-1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, min. of Health and Family Welfare, Govt. of India, Nirman Bhawan, New Delhi. P - 335.

9. National Health Policy, Min. of Health & Family Welfare, Nirman Bhawan, New Delhi, 1983

10. Srinivasa D K etal, Medical Education Principles and Practice, 1995. National Teacher Training Centre, JIPMER, Pondicherry

Chapter IV

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Model Checklists are given in this Chapter which may be copied and used.

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

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational 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 (see Model Checklist – I, Chapter IV)

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 (see Model Checklist-II, Chapter IV)

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.

iv) ***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 (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

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. (Table No.3, Chapter IV)

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 (See Model checklist V, Chapter IV)

vi) Periodic tests: In case of degree courses of three years duration, 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, practicals / clinicals and viva voce.

In case of diploma courses of two years duration, the concerned departments may conduct two tests, one of them be at the end of first year and the other in the second year 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 log book is a record of the important activities of the candidates during his training, Internal assessment should be based on the evaluation of the log book. Collectively, log books 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.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

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.

CHAPTER IV (Contd.)

Format of Model Check Lists

Check List -I. MODEL CHECK-LIST FOR EVALUATION OF JOURNAL REVIEW PRESENTATIONS

Name of the Student: Name of the Faculty/Observer: Date:

Sl. No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Article chosen was					
2.	Extent of understanding of scope & objectives of the paper by the candidate					
3.	Whether cross references have been consulted					
4.	Whether other relevant publications consulted					
5.	Ability to respond to questions on the paper / subject					
6.	Audio-Visual aids used					
7.	Ability to defend the paper					
8.	Clarity of presentation					
9.	Any other observation					
	Total Score					

Check List - II. MODEL CHECK-LIST FOR EVALUATION OF SEMINAR PRESENTATIONS

Name of the Student: Name of the Faculty/Observer: Date:

Sl. No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Whether other relevant publications consulted					
2.	Whether cross references have been consulted					
3.	Completeness of Preparation					
4.	Clarity of Presentation					
5.	Understanding of subject					
6.	Ability to answer questions					
7.	Time scheduling					
8.	Appropriate use of Audio-Visual aids					
9.	Overall Performance					
10.	Any other observation					
	Total Score					

Check List - III

MODEL CHECK LIST FOR EVALUATION OF CLINICAL WORK IN WARD / OPD

(To be completed once a month by respective Unit Heads including posting in other departments)

Name of the Student: Name of the Unit Head: Date:

Sl. No.	**Points to be considered:**	**Poor 0**	**Below Average 1**	**Average 2**	**Good 3**	**Very Good 4**
1.	Regularity of attendance					
2.	Punctuality					
3.	Interaction with colleagues and supportive staff					
4.	Maintenance of case records					
5.	Presentation of cases during rounds					
6.	Investigations work up					
7.	Bedside manners					
8.	Rapport with patients					
9.	Counseling patient's relatives for blood donation or Postmortem and Case follow up.					
10.	Over all quality of Ward work					
	Total Score					

Check List - IV

EVALUATION FORM FOR CLINICAL PRESENTATION

Name of the Student: Name of the Faculty: Date:

Sl. No.	Points to be considered	Poor 0	Below Average 1	Average 2	Above Average 3	Very Good 4
1.	Completeness of history					
2.	Whether all relevant points elicited					
3.	Clarity of Presentation					
4.	Logical order					
5.	Mentioned all positive and negative points of importance					
6.	Accuracy of general physical examination					
7.	Whether all physical signs elicited correctly					
8.	Whether any major signs missed or misinterpreted					
9.	Diagnosis: Whether it follows follows logically from history and findings					
10	Investigations required ▪ Complete list					
	▪ Relevant order					
	▪ Interpretation of investigations					
11.	Ability to react to questioning Whether it follows logically from history and findings					
12.	Ability to defend diagnosis					
13.	Ability to justify differential diagnosis					
14.	Others					
	Grand Total					

Check List - V

MODEL CHECK LIST FOR EVALUATION OF TEACHING SKILL PRACTICE

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 AV aids appropriately		

Check list VI

MODEL CHECK LIST FOR DISSERTATION PRESENTATION

Name: Faculty/observer: 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					

Checklist-VII

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE / CO-GUIDE

Name of the Student: Name of the Faculty/Observer: Date:

Sl. No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
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					

LOG BOOK

Table 1 : Academic activities attended

Name: Admission Year:

College:

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:

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

LOG BOOK

Table 3 : Diagnostic and Operative procedures performed

Name: Admission Year:

College:

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

*** Key:**
O - Washed up and observed
A - Assisted a more senior Surgeon
PA - Performed procedure under the direct supervision of a senior surgeon
PI - performed independently

Model Overall Assessment Sheet

Name of the College: **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.

Chapter V

Medical Ethics
Sensitisation 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 Objective (ii) stated in Chapter II (pages 2.1 to 2.3), and develop human values it is urged that ***ethical sensitisation*** 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 presentation, bedside rounds and academic postgraduate programmes.

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
   Heteronomous 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 Behaviour 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 Intrafallopian Transfer (SIFT),
Gamete Intrafallopian Transfer (GIFT), Zygote Intrafallopian 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

9. *Ethical workshop of cases*
Gathering all scientific factors
Gathering all human factors
Gathering all value factors
Identifying areas of value – conflict, Setting of priorities,
Working out criteria towards decisions

Recommended Reading

Francis C.M., **Medical Ethics**, 1 Ed, 1993, Jaypee Brothers, New Delhi, p 189, Rs. 60/-