Minimum standards for courses affiliated to

Kerala University of Health Sciences

Thrissur 680596

M.Sc. Diploma in Radiological Physics

Dip.RP.

Course code: 304

MINIMUM STANDARD REQUIREMENT FOR POST M.Sc. DIPLOMA IN RADIOLOGICAL PHYSICS COURSE

1. GENERAL DESCRIPTION OF THE COURSE

No.	Item	Description
1.1	**Title of the Course**	Post M.Sc. Diploma in Radiological Physics, abbreviated as "Dip.RP".
1.2	**Aim of the course**	To train the student to acquire the skill and competence to work as medical radiation physicists and radiation safety officers to use radiation safely on patients in diagnosis and therapy. It is insisted that the course be conducted only in a teaching institution attached to a hospital having modern Radiotherapy, Nuclear Medicine, and Diagnostic Imaging facilities, and has to be taught by the Radiation Physics Faculty.
1.3	**Objectives of the Course**	a) Goal The course has been designed to train the student to acquire the skill and competence to work as medical radiation physicists and radiation safety officers to use radiation safely on patients in diagnosis and also in therapy. It is insisted that the course be conducted only in teaching institutions attached to a hospital having modern Radiotherapy, Nuclear Medicine, and Diagnostic Imaging facilities. b) General Objectives This post PG Diploma will enable the successful candidate to practice Medical Physics profession, a few of which are mentioned below: Radiological safety of patients and staff and public Plan radiation treatments for cancer patients, Study how radiation affects the body, ensure equipment is safe, effective, and working properly, develop new safety procedures, Consult with colleagues. Preparation of Site Plan from radiation safety point of view and obtaining permission from AERB for setting up diagnostic radiology and radiotherapy installations. Commissioning of radiotherapy installations. Periodic Quality Assurance of radiotherapy and diagnostic radiology equipment.

		Teaching Medical Radiation Physics to undergraduate, postgraduate medical, and paramedical students. Undertaking research work related to the use of radiation for diagnosis and therapy.
1.4	**Admission Capacity**	The number of seats in one unit of admission is 4 seats.
1.5	**Duration**	Two years, including one year mandatory internship in the Institution of Radio-diagnosis, Radiotherapy, and Nuclear Medicine. The maximum time limit for completing the course successfully is 4 years.
1.6	**Academic Eligibility**	i. M.Sc Physics with B.Sc degree with Physics as main subject Or Integrated M.Sc Physics (all regular courses) conducted by any recognized University in Kerala or equivalent there to as recognized by any university in Kerala and shall have minimum of 60 % marks in all the years of University examinations of the course through full time regular mode of study. The candidate shall have obtained permanent registration in the respective state council, wherever applicable. ii. In case of the Grade system, the Grade to percentage of mar conversion scheme obtained from the University should be submitted along with the application. iii. Usual relaxation of age and marks in the qualifying examination for SC/ST and SEBC and differently abled candidates as fix by the competent authority. iv. The candidate shall be an Indian citizen unless otherwise exempted v. The candidate shall be medically fit to undergo the course.
1.7	**Mode of Selection**	The selection of the students shall be made strictly based on an entrance examination with objective-type questions of 2 hours duration, followed by an interview. A candidate should secure at least 20 (out of 100) marks in the entrance examination. A maximum of twelve candidates (three times the number of seats) based on their rank in the entrance examination will be called for the Interview. The entrance examination questions shall be multiple choice type (each correct answer carries 1 mark and each wrong answer carries -0.25 mark) and they would cover subjects as

		detailed below, M.Sc. Level Physics - 60 %. B.Sc. Subsidiary level Mathematics – 20%. B.Sc. Subsidiary level Chemistry – 10 %. Basic Human Physiology and Anatomy – 10%.
1.8	**Allotting Authority**	Agency approved by Govt. of India/Govt. of Kerala/KUHS from time to time.
1.9	**Seat Reservation**	As stipulated by Govt of India/Govt of Kerala from time to time
1.10	**Subjects of Study**	
1.10.1	**1st Year**	**Theory** Radiation Physics and Radiation Generators Radiological mathematics Clinical and Radiation Biology Medical imaging Radiation Dosimetry and Standardisation Radiation Detectors and Instrumentation Radiation Therapy Radiation Safety **Practicals** 1. Radiation Detection and Measuring Instruments 2. Medical Imaging 3. Planning and Dosimetry in Radiotherapy 4. Quality Assessment of Radiotherapy equipment 5. Quality Control, Acceptance testing and calibration of radiological equipment **Project Work**
1.10.2	**2nd Year**	After successful completion of the first-year course, Internship will be started from the very next working day of releasing the result by KUHS

1.10.4	Medium of instruction and examination	English
1.11	**Controlling Authorities**	Govt. of India/Govt. of Kerala/Apex Council/KUHS
1.12	**Registration**	NOT REQUIRED
1.13	**Availability of the Course**	visit -www. kuhs.ac.in
1.14	**Scope for Higher Studies**	The successful candidates can pursue PhD in clinical medical physics field.

2 MINIMUM REQUIREMENT TO APPLY FOR ESTABLISHING AN INSTITUTION TO STARTPOST M .Sc Dip.RPCOURSE

No	Item	Requirement
2.1	**Eligibility to Apply for the Course** Only a Medical Physics/Radiation Physics department, defined as an independent academic entity of a teaching institution with an attached 300-bedded hospital for Radiotherapy, Medical and Surgical Oncology taken together, shall be permitted to conduct the post M.Sc. Dip RP program. The Institution should have well-established Departments of Radiotherapy, Nuclear Medicine, and Diagnostic Radiology Services with CT and MRI. The Medical/Radiation Physics Department should have lab facilities and also all radiation measuring tools required for calibration of equipment and to ensure radiation protection.	
2.1.1	**The applicant seeking affiliation shall meet the following eligibility criteria:** i. The institution shall be the one fully equipped for imparting education in Post M.Sc Diploma in Radiological Physics course with essential provisions for supporting the course ii. Institutions having an existing affiliation for any Health Science course from another University shall not be eligible to apply for affiliation to the KUHS. iii. Need to satisfy the requirements of the Atomic Energy Regulatory Board/ proposed Central Council/State Paramedical Council before or after applying to KUHS, as the case may be	
2.1.2	**The applicant for affiliation shall be an institution owned and managed by:** **As per 2.1.2 of the General MSR**	
2.1.3	**Qualifying criteria.** **As per 2.1.3 of the General MSR**	
2.1.4	**General conditions to be satisfied by colleges –** **As per 2.1.4 of the General MSR**	
2.2	**Land Requirement**	

2.2.1	**Owner ship**	***Hospital facility:*** The hospital shall be suitably spacious to accommodate all facilities required for the course and as specified in the Regulation of the respective Statutory Council/ MSR for the course. Only a Medical Physics/Radiation Physics department, defined as an independent academic entity of a teaching institution with an attached 300-bedded hospital for Radiotherapy, Medical and Surgical Oncology taken together, shall be permitted to conduct the post M.Sc. Dip RP program. The Institution should have well-established Departments of Radiotherapy, Nuclear Medicine, and Diagnostic Radiology Services with CT and MRI. The Medical/Radiation Physics Department should have lab facilities and also all radiation measuring tools required for calibration of equipment and to ensure radiation protection.
2.2.2	***Area:***	1 acre in the Corporation /Municipality area and 2 acres in the Panchayath area
2.2.3	***Single/Multiple:***	Should be as a single plot
2.2.4	***Distance between plots:***	Not Applicable
2.2.5	***Availability of water:***	Adequate and safe continuous drinking water facilities must be provided for staff and students. Also, should provide a continuous water supply to the Academic block, Hospital, Laboratories, Hostels etc
2.2.6	***Availability of electricity:***	There shall be a continuous power supply round the clock with generator facility, provided to the Hospital, College, Hostels, and all other infrastructure areas
2.3	**Hospital Requirement**	
2.3.1	**Ownership**	**Ownership** As per 2.3.1 of General MSR **Hospital Facility-** Only a Medical Physics/Radiation Physics department, defined as an independent academic entity of a teaching institution with an attached 300-bedded hospital for Radiotherapy, Medical and Surgical Oncology taken together, shall be permitted to conduct the post M.Sc. Dip RP program. The Institution should have well-established Departments of Radiotherapy, Nuclear Medicine, and Diagnostic Radiology Services with CT

		and MRI. The Medical/Radiation Physics Department should have lab facilities and also all radiation measuring tools required for calibration of equipment and to ensure radiation protection.
2.3.2	Bed Strength	300
2.3.3	In Patient status	Not Mandatory
2.3.4	Departments Needed	Medical/Radiation Physics, Radiotherapy, Medical & Surgical Oncology, Radiodiagnosis.
2.3.5	Exclusive requirement for the course	Equipment like Telecobalt/Linear Accelerator, HDR Brachytherapy Unit, CT Simulator, Mould Room facility, Treatment Planning Systems; CT Scanner, Radiography-Fluoroscopy unit (Digital/II based), Ultrasonography Machine with color Doppler; MRI, Gamma Camera. An independent Radiation Physics department with sufficient academic faculty is a prerequisite
2.3.6	Exclusive Equipment/ labs needed for the course	*Appendix 3 .4*
2.3.7	**Hospital Staff needed**	*Refer 3.3*
2.3.8	Distance from Teaching Institution	Less than 15 km
2.4	**Infra Structure Requirement**	
2.4.1	College Building	As per3.2
2.4.2	Hostels	Shall fulfil criteria specified for approval of Hostels by Apex Council and KUHS
2.5	**Clinical Requirement**	
2.5.1	Out Patients	Not Mandatory
2.5.2	***In Patients***	Not Mandatory
2.6	Man Power requirement Refer 3.3	
2.6.1	A minimum of one Professor of Radiation Physics, One Additional Professor of Radiation Physics or Associate Professor of Radiation Physics / Reader, one Assistant Professor of Radiation Physics and Lecturer in Radiation Physics/Resident Medical Physicist should be available to start the course and to maintain it.	
2.6.2	The service of Technical and ministerial staff of the hospital can be utilized as and when required.	
2.7	**Statutory Permissions**	
2.7.1	State/Central Govt	As per 2.7.1 of General MSR

2.7.2	Statutory Councils	The applicant should obtain necessary Consent/Permission from the State/Central Councils governing the course as applicable.
2.8	**Other Requirements**	The documents mentioned under item 2.8 should be submitted along with the application form
2.8.1	Resolution of the Trust	Attach an attested copy of the specific Resolution of the Trust/Management mentioning the name of the institution and the name of the course being requested
2.8.2	Detailed Project Proposal	The applicant shall submit a detailed project report for starting and continuing the academic programme, fulfilling the norms of the apex council and KUHS along with the application
2.8.3	Legal Documents	As per 2.8.3 of General MSR
2.8.4	Financial Statement	Attach attested copy of Audited Balance sheet of the applicant entity for the previous 3 (three) years for non-governmental organizations and budget allocation for parent institution in case of Government.
2.8.5	Essentiality/NOC from Govt/Central/State Apex Councils	The certificate regarding feasibility and desirability for admission capacity at the college has to be obtained by the applicant from the Government/Central/State Councils
2.8.6	Approved Plan	As per 2.8.6 of General MSR
2.8.7	Clearance from Pollution Control Board	As per 2.8.7 of General MSR
2.8.8	Under taking	As per 2.8.8 of General MSR
2.9	**Time & Mode of Application**	As per the Notification of KUHS for a particular Academic Year
2.9.1	Application Fee	As fixed by KUHS from time to time
2.9.2	Processing of application	As per 2.9.2 of General MSR
2.10	**Perspective Plan: Background Information to be Provided with the application**	

3 MINIMUM STANDARDS / REQUIREMENTS (MSR)TO START THE COURSE

3.1	**LAND FOR THE INSTITUTION**	
3.1.1	Owner ship of land	As per 3.1.1 of General MSR
3.1.2	Area required	Adequate space should be available in the hospital to set up the Department of Radiation Physics as mentioned in Item 3.2.1.
3.1.3	Single/Multiple	Should be as a single plot
3.1.4	Distance between Plots	Not applicable
3.1.5	Certificates from local authorities	It is mandatory to attach a copy of the attested Site Plan and Building plan, including the Academic block, Administrative block, hostels, playground, as approved by the Local Self Government
3.1.6	Distance from Hospital	Parent Hospital should be preferably within the same campus or within 15 km from the institution by road, unless specified otherwise in the Regulation of the respective Statutory Council/ MSR for the course
3.1.7	Availability of Water	Adequate and safe continuous drinking water facilities must be provided for staff and students. Also, should provide a continuous water supply to the Academic block, Hospital, Laboratories, Hostels, etc.
3.1.8	Availability of Electricity	There shall be a continuous power supply round the clock with generator facility, provided to the Hospital, College, Hostels, and all other infrastructure areas.
3.1.9	Availability of Public conveyance	A good public transport system should be available at the campus or at a maximum of 500 metre distance from the Institute by road.
3.1.10	Waste disposal	Adequate waste disposal measures should be taken as per the Govt .norms.
3.1.11	Permission from the Pollution Control Board	All the academic institutions shall take adequate pollution control measures by providing waste disposal measures, including bio-medical waste, sewage water treatment plant, and other requirements specified by the Pollution Control Board and Local Self-Government, and submit a copy of the Clearance certificate as necessary.
3.1.12	Play ground	Can be shared with other courses in the Institute/College
3.1.13	Parking area	Adequate parking space shall be made available for the parking of institutional vehicles, vehicles of staff, students, and patients.
3.2	**INFRASTRUCTURE FOR THE COLLEGE**	
3.2.1	Total plinth area Required	Building area–12000 Sq. Ft. The hospital should have a plinth area adequate enough to house the departments mentioned below The hospital/Institution should have the following essential departments

<table>
<tr><td></td><td></td><td>Radiation Physics Division 3800 sqft
Radiation Oncology Division 10000 sqft
Nuclear Medicine 10000 sqft
Radiology Division 10000 sqft
Medical Oncology Division
Surgical Oncology Division</td></tr>
<tr><td>3.2.2</td><td>Approved Plan for the Building</td><td>As per 3.2.2 of the General MSR</td></tr>
<tr><td>3.2.3</td><td>Lecture Halls with teaching aids</td><td>One classroom with 16 chairs and one Table with AV aids supported. The room should be well ventilated with a proper lighting system. There should be built-in Black/Green/White Boards. Also, there should be a desk/ dais/a big table and a chair for the teacher and racks/cupboards for keeping teaching aids or any other equipment needed for the conduct of classes.
<table>
<tr><th>Sl. No.</th><th>Teaching Block</th><th>Minimum Area (Figures in Sqft)</th></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>3.2.3</td><td>Lecture Hall with Teaching Aids</td><td>450</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>3.2.4</td><td>Auditorium/ Multipurpose Hall /</td><td>Common</td></tr>
<tr><td>3.2.5</td><td>Examination hall with a confidential room</td><td>Common</td></tr>
<tr><td>3.2.6</td><td>Laboratory</td><td></td></tr>
<tr><td></td><td>(i) Radiation Physics Lab</td><td>350</td></tr>
<tr><td>3.2.7</td><td>Library</td><td>Common</td></tr>
<tr><td>3.2.8</td><td>Faculty Room (Radiation Physics alone)</td><td>800</td></tr>
<tr><td>3.2.9</td><td>One Room for Department Head</td><td>200</td></tr>
<tr><td>3.2.10</td><td>Common Room (Male & Female)</td><td>200</td></tr>
<tr><td>3.2.11</td><td>Dosimetry room</td><td>150</td></tr>
<tr><td>3.2.12</td><td>Toilets</td><td>120</td></tr>
<tr><td></td><td>Total</td><td>2300</td></tr>
</table></td></tr>
<tr><td>3.2.4</td><td>Examination Hall with confidential room</td><td>As per 3.2.4 of General MSR
May be shared with other courses in the institute/college</td></tr>
<tr><td>3.2.5</td><td>Auditorium/Multipurpose hall</td><td>As per 3.2.5 of General MSR
May be shared with other courses in the institute/college</td></tr>
<tr><td>3.2.6</td><td>Common Room</td><td>As per 3.2.6 of General MSR
May be shared with other courses in the institute/college</td></tr>
<tr><td>3.2.7</td><td>Staff Rooms(Radiation Physics alone)</td><td>As per 3.2.7 of General MSR</td></tr>
<tr><td>3.2.8</td><td>Administrative Block</td><td>As per 3.2.8 of General MSR
May be shared with other courses in the institute/college</td></tr>
</table>

3.2.9	Central Store	As per 3.2.9 of General MSR May be shared with other courses in the institute/college
3.2.10	Laboratories	There should be at least one Radiation Physics Lab (of at least 350 sqft) with at least the following facilities/equipment. It should have GM Counter Set up, Survey meters, Pocket dosimeters, Therapy level dosimeter, TLD/OSLD Reader, TL/OSL Phosphor, Laboratory sources (Beta and Gamma emitters), Diagnostic QA Kit, Dosimetry and QA phantoms, Radiation Field Analyzer, Radiation Absorber sheets, Well type ionization Chamber, Film dosimetry system (desirable) etc,
3.2.11	Library	A library with at least 2 sets of standard textbooks in Anatomy, Physiology, Biochemistry, Radiodiagnosis, Radiotherapy, Nuclear Medicine, Radiation Physics, and/ Medical Physics in Imaging, Radiotherapy, and Radiation Protection. If the hospital has a well-equipped library, it can be enriched with textbooks related to radiation physics and allied sciences.
3.2.12	Toilet	i. Separate toilets for boys and girls shall be made available in each floor. ii. Toilets for teachers (Separate for male and female) shall be made available. iii. Facilities for hygienic disposal of used sanitary napkins(electrically operating sanitary napkin incinerator) must be available in female toilets Separate toilets (at least 40 sqft each) for men and women should be provided.
3.2.13	Garage	A garage to accommodate vehicles of the Institute should be maintained within the campus.
3.2.14	Canteen	There should be provision for a common canteen for the students, their guests, and staff members.
3.2.15	Transportation facilities	The college should have a separate transportation facility under the control of the principal for use of staff and students.
3.2.16	Room for audio-visual aids	A room should be provided for the proper and safe storage of all the Audio-Visual Aids.
3.2.17	Fire & Safety measures	Adequate provision for extinguishing fire should be available with a valid certification from the fire & safety authority.

3.3 MAN POWER REQUIREMENT

	Designation	Qualification	Experience

3.3.1.1	Principal (Director of the Institution)	As per the Academic Institution Policy	
3.3.1.2	Vice Principal (Additional Director of the Institution)	As per the Academic Institution Policy	
3.3.1.3	Professor and Head	1. M.Sc. Physics I or II class and one year training in Radiological Physics (Diploma In Radiological Physics) conducted by BARC, Mumbai or equivalent OR M.Sc Medical Physics I or II class OR MSc. Radiation Physics 1st or IInd class. 2. PhD from a recognized University	14 years teaching and/or research experience in the discipline/subject concerned after obtaining the Doctorate Degree.
3.3.1.4	Additional Professor / Associate Professor		4 years of teaching and or research experience as an Associate Professor in the discipline/subject concerned 4 years of teaching and or research experience as Assistant Professor in the discipline/subject concerned
3.3.1.5	Assistant Professor	MSc Physics + 1 year Post PG Diploma in Radiological Physics or equivalent / MSc Medical Physics	3 years teaching and/or research in the discipline/subject concerned
3.3.1.6	Lecturer/Resident Medical Physicist/Medical Physicist	MSc Physics + 1 year PG Diploma in Radiological Physics or equivalent / MSc Medical Physics	One year of experience. / Internship as part of Diploma in Radiological Physics

3.3.2	***Administrative staff*** Administrative Officer, Office Sudt, PA to Principal, Accountant/Cashier, DEO/Comp Asst, Clerk, Store Keeper, Office/Classroom Attender, etc	The service of the Ministerial staff of the hospital can be utilized.
3.3.3	***Laboratory Staff*** Lab Instructor, Lab Technician etc	The service of the teachers can be utilized.
3.3.4	***Library staff*** Librarian, Attender etc	The service of the hospital library staff can be utilized.
3.3.5	***Technical staff*** Electrician, Plumber &Mechanic etc	The service of the hospital technical staff can be utilized.
3.3.6	***Supporting staff*** Cleaning Staff, Security staff &Driver etc	The service of the hospital's supporting staff can be utilized
3.4	**EQUIPMENTS & INSTRUMENTS**	

(Specialty-wise requirements)

The Minimum clinical facilities required for the conduct of the course.

Radiotherapy/ Radiation Physics Division	Teletherapy (Cobalt 60/LINAC)	2
	Brachytherapy (Manual/remote after loading systems)with at least 3 sets of Gynaec applicators.	1
	CT simulator	1
	Treatment planning system	2
Radiodiagnosis	MRI (≥1.5T)	1
	CT Scanner	1
	Radiography-Fluoroscopy unit (Digital/IITV)	1
	500mA Radiography unit	1
	Ultrasonography Machine with Colour Doppler	1
Nuclear Medicine	Gamma Camera	1
	Radioiodine Therapy Unit	1
	PET Scanner	1
Others		1
	Attached Hospital (300-bedded for Radiotherapy, Medical, and surgical oncology)	1

	Teacher: Student Ratio
Professor	1: 4
Assoc/Addnl Professor	1: 4
Assistant Professor	1: 2
Lecturer/Resident Medical Physicist	

3.5 LABORATORY

(Speciality wise requirements)

Radiation Physics Lab is required. Refer 3.2.10

3.6 LIBRARY

(Specialty-wise requirements)

If the hospital has a library and conducts other courses under KUHS, its service can be utilized by the DipRP students. A sufficient number of books related to the course should be made available. Refer 3.2.11

3.7 HOSTEL

Shall fulfil the criteria specified for approval of Hostels by the Apex Council and KUHS

3.8 PARENT HOSPITAL

This course should only be conducted in a teaching institution where all facilities for managing the cancer cases, especially with radiotherapy treatment modalities, are available. Refer Items 2.1, 3.2.1, 3.2.10, 3.4
