

**Revised Ordinance Governing Minimum Essential Requirements
for Allied Health Sciences for starting fresh Bachelors courses in
Allied Health Sciences in RGUHS - 2018**

B.Sc MEDICAL IMAGING TECHNOLOGY



***RAJIV GANDHI UNIVERSITY OF
HEALTH SCIENCES, KARNATAKA***

4th 'T' Block, Bangalore 560 041

**Annexure to University Notification No. RGU/AUTH/135-SYN/36(1)/2018-19
dated 17.09.2018**

**Revised Ordinance Governing Minimum Essential Requirements for Allied
Health Sciences for starting fresh Bachelors courses in Allied Health
Sciences in RGUHS -2018**

B.Sc Medical Imaging Technology

Rajiv Gandhi University of Health Sciences, Karnataka offers the following Bachelors courses in Allied Health Sciences Faculty. The duration of the course and the requirement of infrastructure such as hospital facility, minimum intake for the said courses are as under : -

Sl No	Course	Duration	Minimum seats	Maximum seats	Own Hospital/Lab	MOU for Hospital/Lab
01	B.Sc. Anesthesia Technology	3 years 6 months	10	30	Mandatory	Not permitted
02	B.Sc. Operation Theatre Technology	3 years 6 months	10	30	Mandatory	Not permitted
03	B.Sc. Neuroscience Technology	3 years 6 months	10	20	Mandatory	Not permitted
04	B.Sc. Cardiac Care Technology	3 years 6 months	10	20	Mandatory with Cath lab & Cardiac OT	Not permitted
05	B.Sc. Perfusion Technology	3 years 6 months	10	20	Mandatory with Cath lab & Cardiac OT	Not permitted
06	B.Sc. Renal Dialysis Technology	3 years 6 months	10	20	Mandatory	Not permitted
07	B.Sc. Respiratory Care Technology	3 years 6 months	10	20	Mandatory	Not permitted
08	B.Sc. Radiotherapy	3 years 6 months	10	20	Mandatory	Not permitted
09	B.Sc. Medical Imaging Technology	3 years 6 months	10	40	Desirable	Permitted with adequate equipment's and workload
10	B.Sc. Medical Lab Technology	3 years 6 months	10	40	Desirable	Permitted with adequate equipment's and workload

11	B.Sc. Optometry	4 years	20	30	Mandatory	Not permitted
12	Bachelors in Hospital Administration	3 years (6 Semesters)	10	40	Desirable	Permitted
13	Bachelors in Public Health	4 years (8 Semesters)	10	40	Desirable	Permitted
14	Bachelors in Prosthetics & Orthotics	4 years 6 months	10	30	Mandatory	Not permitted

2(a) The general guidelines for all Bachelors courses in Allied Health Science :

1. Increase in take for any course shall be considered only after the 1st batch of students admitted complete the tenure of the course.
2. Certain courses need in house hands on training hence such courses affiliation shall be given to only those Colleges which have their own Hospital with respective department fully functional with necessary medical personnel with adequate clinical workload as specified in respective course ordinance. Colleges which have a tie up or MOU with other Hospitals shall not be considered for starting such courses.
3. Whenever a college wishes to start a Master's program, the college should have already been affiliated to offer Bachelors program from the same subject specialty with at least one batch of students having successfully completed the bachelor's course.

(b) Intake for courses:

1. B.Sc. Imaging Technology & B.Sc. Medical Lab Technology courses shall have a minimum intake of 10 seats and maximum intake of 40 seats and colleges applying for the same shall have their own clinical set up offering respective facilities or an MOU with an 100 bedded Hospital or an NABL accredited Laboratory with adequate workload. Colleges which have own clinical/lab facility can be given 20 seats at the start whereas colleges which have an MOU can be given 10 seats when the college is started.
2. B.Sc. Optometry shall have a minimum intake of 20 seats but colleges applying for the same shall have their own Hospital which has an active ophthalmology department with adequate clinical workload as mentioned in the minimum criteria for B.Sc. optometry Course
3. Courses like B.Sc. Anaesthesia Technology, B.Sc. Operation Theatre Technology, B.Sc. Cardiac Care Technology, B.Sc. Perfusion Technology, B.Sc. Renal Dialysis Technology, B.Sc. Neuroscience Technology, B.Sc. Respiratory Care Technology, B.Sc. Radiotherapy and B.Sc. Prosthetics & Orthotics shall have their own clinical set up with respective departments functional with adequate work load as mentioned in minimum criteria for starting such courses and the seat intake shall be 10 seats when the course is being started for the first time in a college.
4. Courses like Bachelors in Hospital Administration and Bachelors in Public Health shall have an intake of 30 seats provided the college has its own hospital / NGO which provide adequate hands on training for the students admitted to the course as mentioned in

minimum criteria for respective course. Colleges which have a tie up or MOU with a Hospital / NGO shall have be granted only 20 seats when an application for fresh affiliation is made.

5. The colleges which have already been sanctioned affiliation and do not have the necessary infrastructure like hospital, clinical facility shall be given a minimum time frame to create the same and an affidavit to this effect should be taken from the college management where in it is also made clear that if the college does not adhere to the conditions and fails in providing the necessary infrastructurelike Hospital and clinical facility, it shall forfeit the right to be affiliated with RGUHS.

It is seen that some colleges have been offering Masters program but not Bachelors program even though such program is available in the list of courses offered in RGUHS, if this trend continues there may be a day when colleges will seek admission only for the courses which are in demand hence such colleges which are affiliated to RGUHS are offering Masters courses in AHS subjects but have not started Bachelors course shall be asked to start the same from the academic year 2019-20 failing which necessary action for disaffiliation should be initiated.

(c) Minimum eligibility requirements for Candidates

A candidate seeking admission to the Bachelor of Science Degree Courses in the Allied Health Sciences course from Sl.No. 1 to 14 shall have studied English as one of the principal subject during the tenure of the course and for those seeking admission to the Bachelor of Science Degree Courses in the Allied Health Sciences courses mentioned above except for B.Sc. Imaging Technology and B.Sc. Radiotherapy Technology shall have passed:

1. Two year Pre-University examination or equivalent as recognized by Rajiv Gandhi University of Health Sciences with, Physics, Chemistry and Biology as principle subjects of study.

OR

2. Pre-Degree course from a recognized University considered as equivalent by RGUHS, (Two years after ten years of schooling) with Physics, Chemistry and Biology as principal subjects of study.

OR

3. Any equivalent examination recognized by the Rajiv Gandhi University of Health Sciences, Bangalore for the above purpose with Physics, Chemistry and Biology as principal subjects of study.

OR

4. The vocational higher secondary education course conducted by Vocational Higher Secondary Education of any other State Government with five subjects including Physics, Chemistry, Biology and English in addition to vocational subjects conducted is considered equivalent to plus TWO examinations of Government of Karnataka Pre University Course.

OR

5. Candidates with two years diploma from a recognized Government Board in a subject for which the candidate desires to enroll, in the respective Allied Health Sciences course mentioned in Sl. No. 1 to 14 shall have passed Diploma [10+2] with Physics, Chemistry and Biology, as

principal subjects or candidates with 3 years diploma from a recognized Government Board in a subject for which the candidate desires to enroll, in the respective Allied Health Sciences course mentioned in Sl. No. 1 to 14 should have studied Physics, Biology and Chemistry as principal subjects during the tenure of the course.

6. Lateral entry to second year for allied health science courses for candidates who have passed diploma program from the Government Boards and recognized by RGUHS and these students are eligible to take admission on lateral entry system only in the same subject studied at diploma level from the academic year 2008-09 vide RGUHS Notification no. AUTH/AHS/317/2008-09 dated 01.08.2008.

7. In case of admission to B.Sc. Imaging Technology or B.Sc. Radiotherapy Technology the candidate should have passed Pre-University or equivalent examination with Physics, Chemistry, Biology and Mathematics, as principal subjects of study

Note

- a. The Candidate shall have passed individually in each of the principal subjects
- b. Candidates who have completed diploma or vocational course through correspondence shall not be eligible for any of the courses mentioned above

3. Optimum Duration of the course :

Duration shall be for a period of three and half (3 ½) years including six (6) months of internship

4. INFRASTRUCTURE:

1. Three x-ray each with an area of 900 Sq. ft.
2. Three Class rooms each with a capacity for 10 students. (**each not less than 600 sq. ft. each**)
3. Lab facilities for Basic Medical Sciences as per the criteria mentioned in Basic Medical Sciences requirements.
4. Lab equipments for Basic Medical Sciences as per the criteria mentioned in Basic Medical Sciences requirements.
5. a. Board (Black or White) - Mandatory
b. Multimedia / Computer and its accessories / LCD Projector

5. MINIMUM REQUIREMENTS FOR TEACHING BASIC MEDICAL SCIENCES SUBJECTS:

ANATOMY:

Specimens, Models, Charts, Dissected body parts, slides as per syllabus.

PHYSIOLOGY:

One Microscope per student, One Stethoscope per student, demonstration equipment for complete blood count, Blood grouping and matching kits, B.P apparatus one per student, Staining apparatus with few common stains, Spirometer for demonstration purpose.

BIOCHEMISTRY:

Digital balance, titration apparatus, laboratory glassware, calorimeter, spectrophotometer, pH meter, basic kits for determining urine sugars / ketone bodies, proteins etc.

MICROBIOLOGY:

Microscope, Hot air oven, Autoclave, Incubator, Electronic analytical balance, Water bath, Vortex mixer, Laminar air flow chamber, Glass wares (beaker, conical flask, pipettes, test tubes, petridish), Refrigerator, Felix & drayer's tube, Bunsen burner, Culture media, Centrifuge, Inoculation loop, Latex agglutination tiles, Vdrl rotator, McIntosh filter anaerobic jar, Micro titre plate, Inspisator

PATHOLOGY:

Haemocytometer – rbc & wbc count, Haemoglobinometer, Wintrob's tube, Westergren tube & stand, Lancet, Capillary tube, Whatman no.1 filter paper, Centrifuge, Microscope, Glass slide, Test tubes, Blood group reagent, Dpx, Coplin jar, H & e stain, Leishman stain, brilliant cresyl blue stain, pasteur pipette, special stains, diluting fluid - rbc, wbc, plt, pap stain, Coomb's reagent, Phosphate buffer, Distilled water

1. Teaching Staff:

1. Principal / Professor & HOD,

- a. MD –Radiology or with 5 yrs. Teaching Experience in a Medical College
- b. M.Sc. Medical Imaging (2 years course) with 10 years teaching experience in a College

2. Associate Professor:

- M.Sc. Medical (Anatomy, Physiology, Biochemistry, Microbiology, pathology, Pharmacology) with 6 years teaching experience
 - M.Sc. MLT (2 years course) Microbiology/Biochemistry/Hematology with 7 years teaching experience
 - MD(Microbiology/Biochemistry/Pathology/Physiology/Pharmacology)
 - MS(Anatomy)
- As per MCI/NMC norms
- M.Sc. Medical Imaging Technology Phd - minimum 3 year
 - M.Sc. Medical Imaging (2 years course) - minimum 07 years teaching experience

3. Assistant Professor:

- a. M.Sc. Medical (03 years course) (Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Pharmacology) with 3 years teaching experience
- M.Sc. MLT (2 years course) Microbiology/Biochemistry/Hematology with 4 years teaching experience
- b. M.Sc. Medical Imaging Technology Phd.
- c. M.Sc. Medical Imaging (02 years course) teaching experience
- d. M. D.(Biochemistry, Microbiology, Pathology/Pharmacology) - As per MCI/NMC norms
- e. MS(Anatomy)-As per MCI/NMC norms

4. Lecturer:

- a. M.Sc. Medical (03 years course) (Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Pharmacology)
M.Sc. MLT (2 years course) Microbiology/Biochemistry/Hematology
- b. M.Sc. Medical Imaging (02 years course)
- c. DMRD

5. Tutor:

B.Sc. Imaging Technology

Minimum no. of Faculty in each Department:

- a) **Anatomy** : ONE
- b) **Physiology**: ONE
- c) **Biochemistry**: ONE
- d) **Microbiology**: ONE
- e) **Pathology**: ONE
- f) **Pharmacology**: ONE
- g) M.Sc. Medical Imaging: Two
- h) **B.Sc. Medical Imaging Tutors**: At least ONE in each dept.
- i) **Lab Instructors** : At least ONE in each departmental practical laboratory
- j) Qualified **X-ray Technologist** with 3 years experience.: ONE
 - a. Qualification of X-ray technologist
 - b. 10+2 or equivalent examination passed with science from a recognized board
 - c. Radiographer's/X-ray technologist's course of minimum two years duration (including in-field training in diagnostic radiology)

ONLY for Anatomy & Physiology subjects visiting faculty services can be availed subject to the qualification criteria for respective subjects

1- Systemic & Pulmonary Diseases: MBBS with MD in General Medicine

Part time teachers services can be availed for subsidiary subjects

Note: **Mentioned in the syllabus be made available mandatorily**

6. Minimum number of faculty: As mentioned above

7. Library: Standard reference books and journals should be made available in each of the subject speciality.

Note: **Books mentioned in the syllabus be made available mandatorily**

8. A Hospital :

The common infrastructure at the Department of **Radiology** refers to technical structures and support, therapy devices, facilities and rooms that are shared by a number of co-workers from different or within the same fields. The ambition is to sustain

and to contribute to the improvement of the possibilities for conductance of high-quality research and education.

Functioning Equipment:

List of equipment required in Medical Imaging Technology:

- A.** The Medical Imaging Unit provides for radiological diagnostic and therapeutic radiological investigations. It may be a single integrated unit or some services may be dispersed.

The most common modalities are:

- general radiology;
- fluoroscopy;
- ultrasound; and
- computed tomography.

Depending on the level of service and the clinical profile of the facility, the unit may also provide:

- OPG and other dental modalities in support of a facio-maxillary service;
- mammography;
- interventional angiography e.g. DSA suite; and
- MRI.

1. Hospital/ Medical imaging technology Facility

Location:

- ⊙ Shall be located as far away as feasible from areas of high occupancy places/departments.
- ⊙ In case the installation is located in a residential complex, it shall be ensured that:-
 - A) Walls of the x-ray rooms on which primary x-ray beam falls are not less than 35 cm thick brick or equivalent.
 - B) Walls of the x-ray room on which scattered x-ray fall are not less than 23 cm thick brick
 - C) There is a shielding equivalent to at least 23 cm thick brick or 1.7 mm lead in front of the door(s) and windows of the X-ray room.

Layout:

- ⊙ The room housing an x-ray unit shall have an appropriate area to facilitate easy movement of staff, patient positioning.
- ⊙ Appropriate structural shielding shall be provided for walls, doors, ceiling and floor of the room housing the X-ray.
- ⊙ Appropriate shielding shall also be provided for the dark room to ensure that the undeveloped X-ray films are not exposed to more than 10 μ Gy per week.

Room Size:

The room housing an X-ray unit shall be not less than 18 m square for general purpose radiography and conventional fluoroscopy.

- The size of room housing the gantry of the CT unit shall not be less than 25 m square.
- Also, not more than one unit of any type shall be installed in the same room, and no single dimension of these X-ray rooms shall be less than 4 m.

Control Panel:

- The control panel of diagnostic X-ray equipment operating at 125 kVp or above shall be installed in a separate with direct viewing and oral communication facilities.
- In case of X-ray equipment operating up to 125 kVp, the control panel can be located in the X-ray room.
- The distance between control panel and X-ray unit/chest stand shall be not less than 3 m for general purpose fixed X-ray equipment.

Warning Light and Placard:

- Red light shall be provided outside the X-ray room and kept "ON" when the unit is in use.
- An appropriate warning placard as indicated in Appendix-II shall also be posted outside the X-ray room

Openings and Ventilation:

Unshielded openings in an X-ray room for ventilation or natural light shall be located above a height of 2 m from the finished floor level outside the X-ray room.

Mammography X-Ray Equipment

Tube Housing:

- Tube housing shall be so constructed that leakage radiation averaged over an area of 100 cm², with no linear dimension greater than 20 cm and located at 5 cm from any point on the external surface of X-ray tube housing, does not exceed 0.02 mGy in any one hour.

Beam Filtration:

- The total filtration in the useful beam shall be not less than 0.03 mm of molybdenum for screen-film mammography for Mo-W alloy target type
- 0.5 mm of aluminium for xero-mammography for W-target X-ray tubes.

Breast Compression Device:

- The degree of breast compression shall be smoothly adjustable and shall remain at the set level during exposure.
- The compression plate shall not attenuate the beam by more than
- 2 mm tissue equivalent material.

TABLE NO: 1

Shielding Material	Distance from centre of patient Table		
	1.5 m	2.0 m	Primary wall of dedicated chest x-ray installation at 2 m
Brick (cm)	23	20	20
Concrete (cm)	15	12	12
Steel (cm)	2.3	2.0	2.0
Lead (cm)	0.17	0.15	0.15
Any other material	2.0 TVT	1.8 TVT	1.8 TVT

Floor (if installation is not on ground floor) and ceiling thickness of 6-8 inch concrete is adequate.

TABLE NO: 2

Mammography

Shielding Material	Distance from centre of patient Table		<ul style="list-style-type: none"> ▪ Standard gypsum wallboard construction is usually adequate to shield the walls of mammography facility (as per thickness given below) ▪ Solid core wooden door (5 cm thick) leading to corridors outside a mammography room provide adequate shielding. Standard wooden doors may not be sufficient if the shielded area has significant occupancy. ▪ Standard concrete construction provides adequate barriers above and below mammographic facilities ▪ Lead lined walls and doors are usually not required
	1.0 m	1.5m	
Gypsum Wallboard (cm)	1.5	1.0	
Plate Glass (cm)	1.0	1.0	
Concrete (cm)	1.0	1.0	
Brick (cm)	1.5	1.0	
Any other material	2 TVT	1.68 TVT	

TABLE NO: 3

Shielding Material	Distance from iso- centre			
	1.5m	2.0 m	2.5 m	3.0
Brick (cm)	27	25	23	20
Concrete (cm)	18	15	13	12
Steel (cm)	2.7	2.5	2.0	1.8
Lead (cm)	0.21	0.18	0.15	0.14
Any other material (No. of TVT's)	3.0 TVT	2.8 TVT	2.6 TVT	2.5 TVT

TABLE NO: 4

Interventional Radiology (Cardiac Angiography)

Shielding Material	Distance from centre of patient Table			
	1.5 m	2.0 m	2.5 m	3.0 m
Brick (cm)	25	23	20	18
Concrete(cm)	18	15	12	11
Steel (cm)	2.5	2.0	1.5	1.3
Lead (cm)	0.2	0.18	0.16	0.15
Any other material	2.35 TVT	2.0 TVT	1.95 TVT	1.8 TVT

TABLE NO: 5

Dental -intra oral radiography (Recommendatory)

Shielding Material	Distance from centre of patient Table					
	1.0m		2 m		4.0m	
	Primary wall	Secondary wall	Primary wall	Secondary wall	Primary wall	Secondary wall
Brick (cm)	12	5	10	5	8	-
Concrete (cm)	9	4	7	2	5.0	-
Lead (cm)	0.1	0.04	0.08	0.02	0.06	-

TABLE NO: 6

Bone Mineral Densitometry

Dose rate at 1m is less than allowable dose limit for public hence no structural shielding is needed even with the smallest room.

Dental CBCT/OPG (Ref. - Report of HPA working party on dental CBCT (HPA-RPD-065))

Shielding Material	Distance from centre of patient Table			
	0.5m*	1.0m	1.5 m	2.0m
Brick (cm)	22	17	15	12
Concrete (cm)	15	11	9.5	8
Baryte Plaster (cm)	1.5	1.0	—	—
Lead (cm)	0.22	0.17	0.15	0.12
Any other material	2.6 TVT	2 TVT	1.72 TVT	1.4 TVT

*Considered at this distance as the foot print of this equipment is small 100cm X 150cm

Personel Monitoring Device:

- ⊙ TLD

Survey Meters:

- ⊙ Gas Ionization dosimeter
- ⊙ Scintillation Dosimeter

Protective Aprons:

- ⊙ Protective aprons shall have a minimum lead equivalence of **0.25 mm** and their size/design shall ensure adequate protection to the torso and gonads.
- ⊙ Gonad shields shall have a minimum lead equivalence of **0.5 mm**.

Protective Gloves:

- ⊙ Protective gloves shall have a minimum lead equivalence of **0.25 mm** and the design shall ensure adequate protection against scattered radiation reaching the hands and wrists and shall permit easy movements of hands/ fingers.

Radiological Safety Officer (RSO):

- ⊙ Assist the employer in meeting the relevant regulatory requirements applicable to his/her X-ray installation.
- ⊙ Assist implement all radiation surveillance measures, conduct periodic radiation protection surveys, maintain proper records of periodic quality assurance tests, and personnel doses, instruct all workers on relevant safety measures, educate and train new entrants, and take local measures, including issues of clear administrative instructions in writing, to deal with radiation emergencies.
- ⊙ (Appendix I)

9. Clinical work load

Facilities	10 students
The students should be exposed to all types cases like minor & major Surgical procedures.	
X-ray	Minimum 2/day for one student
C.T Scan	Five different cases/day
MRI Scan	Two Different Cases/day
Mammography	One case /day
Dexa	5 cases per week

A Logbook to be maintained with details of all the postings for each of the student.

10. Minimum faculty requirements for seats sanctioned

Subject	For 10 seats intake	For 20 Seats intake	For 40 seats intake
MD Radiology, DMRD, M.Sc. Imaging Technology (HOD)	01	01	01
Associate Prof MD Radiology, DMRD, M.Sc. Imaging Technology	-	01	01
Lecturer / Assistant Prof / Associate Prof - Anatomy	01	01	01
Lecturer/Assistant Prof / Associate Prof - Physiology	01	01	01
Lecturer/Assistant Prof / Associate Prof – Biochemistry	01	01	01
Lecturer/Assistant Prof / Associate Prof – Microbiology	01	01	01
Lecturer/Assistant Prof / Associate Prof – Pathology	01	01	01
Lecturer/Assistant Prof/Associate Prof – Physics	01	01	01
Tutor (B.Sc. Imaging Technology)	01	01	02
Clinical Workload & Infrastructure			
X-ray procedures	20-25/day	30-40/day	45-60/day
CT Scan procedures	05/day	10/day	20/day
MRI procedures	02/day	04/day	08/day
Mammography	01/day	02/day	04/day
Dexa	05/week	05/week	10/week