OSMANIA UNIVERSITY

ENTRANCE TEST & ADMISSIONS – 2025

POST M.Sc. DIPLOMA IN RADIOLOGICAL PHYSICS

(A TWO YEAR course conducted in collaboration with MNJ Institute of Oncology, KIMS Hospital, American Oncology Institute, Omega Hospital, Basavatarakam Indo-American Cancer Hospital, all at Hyderabad)

INFORMATION BROCHURE

(Instructions, Eligibility Conditions and Syllabus: To be Retained by the Candidate)

Commencement of Submission of Application (Offline)	**: 23-10-2025**
Without late fee of Rs.2000/-	**: 20-11-2025**
With late fee of Rs. 500/-	**: 25-11-2025**
Date of Entrance Exam	**: 30-11-2025**

Note:

1. Candidates are required to fill up the application in their own handwriting and sign it. Further, the candidates are advised to submit the filled in application well before the last date to avoid last minute rush.

2. The entrance test will be of 90 minutes duration and the question paper consists of 100 objective (multiple choice only) type questions. The items will be framed only from the syllabus of entrance test given in this brochure.

3. Candidates have to mark their responses on Optical Mark Reader (OMR) answer sheet for objective type questions by darkening the relevant ovals with a use only Ball Point Pen (Bull / Black) to fill the ovals.

4. Admission will be confirmed after centralized counseling.

5. Candidates have to appear for the entrance test and counseling on their own expense.

6. The eligibility of the candidates is not verified / decided at the time of application and during the entrance test. The verification will be done only during the admissions. Hence, candidates are advised to ensure that they are eligible for the course / subject for which they are applying.

7. Not with standing anything contained in this brochure, the rules and regulations that are in force in the University on the date of counseling will be applicable.

Director
Directorate of Admissions
Osmania University, Hyderabad-500 007
Telangana State, Phone: 8331041286

Post M.Sc. Diploma in Radiological Physics : Details and Eligibility Criteria

1. Objectives:
In recent years, there has been a great demand for qualified medical physicists in hospitals, radiotherapy centres and in certain industries/institutes. As per the Atomic Energy Regulatory Board (AERB) stipulations, qualified Medical Physicists are must to establish radiotherapy centres/hospitals. With this in view, Osmania University, in collaboration with MNJ Institute of Oncology & Regional Cancer Centre, KIMS Hospital, American Oncology Institute, Omega Hospital, and Basavatarakam Indo-Amrican Cancer Centre, all at Hyderabad has decided to offer this course at Department of Physics, O.U. As per the Memorandum of understanding (MoU), cancer Hospitals at Hyderabad will collaborate with Department of Physics, Osmania University in teaching and conducting practicals. A one year internship / field training for the students at the end of two semesters is mandatory and this will be provided by the above Hospitals.

2. Duration of the course (Two years)	:	2 Semesters (one year)+1 year of internship/field training at collaborating hospitals.
3. Eligibility	:	Candidates who have passed M.Sc. in Physics / Nuclear Physics with not less than 60% marks in aggregate through full time programme.
4. Course Intake	:	8 + 8* (sponsored)* *The sponsored seats are open to all and on all India basis. The candidates, with relevant experience, must be sponsored by institutions / hospitals / firms dealing with radiotherapy labs or instruments or such other related areas. The sponsored candidates are also required to qualify in the entrance test. If sufficient number of sponsored candidates are not available, these seats will be filled by other candidates.
5. Admission	:	**Note: 1. The candidates of other states (except TS/AP) are eligible only for sponsored seats.** **2. There are no supernumerary seats in this course.** Admission is based on merit in the entrance test conducted by the Directorate of Admissions, O.U., Hyderabad.
6. Fee	:	Rs. 60,000/- (for sponsored candidates: Rs.1,20,000/-)

Note: Date and Time of Entrance Test will be communicated along with entrance test hall ticket.

7. Entrance Test Syllabus :

PART–A (40 Marks)

MATHEMATICAL PHYSICS AND NUMERICAL METHODS

Legendre's Differential Equations: Power series Solution – Legendre Functions of the first and second kind – Generating function – Rodrigues' Formula – Orthogonal Properties – Recurrence Relations. Bessel's Differential Equations: Power series Solution – Bessel functions of First and Second kind – Generating Function – Orthogonal Properties – Recurrence Relations. Fourier Transforms: Infinite Fourier Sine and Cosine transforms – Properties of Fourier transforms. Laplace transforms and its properties - Inverse Laplase transforms. Errors: Round off Errors – Truncation Errors – Absolute Errors – Relative Errors – Propagation of Errors – Convergence of Iterative Processes – Error estimation. Root Finding Methods: Bisection method - Newton Raphson method. Numerical Differentiation: Forward Difference Quotient – Central Difference Quotient – First and Higher order derivatives - Errors in derivatives. Numerical Integration: Newton-Cotes methods - Simpson's One third and Three eighth methods. Interpolation: Linear interpolation – Lagrange Interpolation - Newton Interpolation – Divided Difference. Curve Fitting: Linear regression – Transcendental regression – Polynomial regressional analysis. System of Linear Equations: Gauss Elimination method – Gauss Jordon method. Ordinary Differential Equations: Taylor Series method – Euler's method.

CLASSICAL MECHANICS

Newtonian Formalism: Inertial frames and Galilean transforms – Non-inertial frames-conservation theorems - Description of rotations in terms of Euler angles-Euler equations and application to motion of symmetric top. Lagrangian Formalism: Constraints – generalized coordinates - Principle of virtual work and D'Alembert's principle – Applications of D'Alembert's principle - Lagrange's equations from D'Alemberts principle - Hamilton's principle. Hamiltonian Formalism: Principle of Least Action and Hamilton's equations - Cyclic coordinates and conservation theorems – Canonical coordinates and Canonical transformations.

QUANTUM MECHANICS

Fundamental Concepts: Basic Principles of Quantum Mechanics - Hilbert–State vectors and operators – Ket, Bra notation - Superposition Principle – Hermitian operators and their properties – Eigen vectors and eigen values – compatible and incompatible observables – projection operator and its physical significance - Uncertainty principle. Theory of Angular momentum: Orbital angular momentum - ladder operators and commutation relations - Generalized angular momentum. Approximation Methods: Time-Independent perturbation theory - Non–degenerate case – first and second order corrections - Perturbed harmonic oscillator and ground state helium atom - Degenerate case – linear Stark effect - Variation method – application to ground state of Helium atom – WKB approximation – alpha decay. Relativistic Quantum Mechanics: Klein-Gordon equation - plane wave solutions and equation of continuity – Dirac equation – probability density – Dirac matrices – plane wave solutions - Significance of Negative energy states.

PART–B (60 Marks)

EM THEORY

Derivation of Maxwell's equation - General wave equation - Poynting vector - Work energy theorem in electrodynamics - Propagation of plane electromagnetic waves in free space - Propagation of E.M. waves in homogeneous isotropic dielectric medium -Propagation of E.M. waves in a conducting medium - Attenuation and Skin effect. Boundary conditions for E,D,B and H - Reflection and Refraction of plane E.M waves at plane interface between two dielectrics - Laws of reflection and refraction - Fresnel's equations – Reflection and Transmission coefficients - Brewester's angle - Total internal reflection - Metallic reflection and its applications.

ELECTRONICS

Semiconductor Devices: Characteristics of Junction diode - Zener diode - Tunnel Diode – BJT - JFET. Amplifiers: h-parameter model of BJT - Biasing of Transistor - Self bias - Single Stage RC coupled amplifier and its frequency response. Wave Shaping: Integration and differentiation using passive elements - Clipping and Clamping circuits using diodes. Feedback Amplifiers: Classification of Amplifiers - The concept of feedback - positive and Negative feedback - Advantages of Negative feedback - Emitter follower and Darlington pair. Sinusoidal Oscillators (Using BJT's): Criterion for oscillations - Phase shift, Wein bridge, Hartley and Colpitts Oscillators - Crystal Oscillator - Collector coupled Astable, Monostable, Bistable multivibrators and Schmitt trigger. Operational Amplifiers: Characteristics of Ideal operational Amplifier - Block diagram of an IC Op-Amp - Analysis of inverting amplifier - Non-inverting amplifiers – Integrator – Differentiator -summing amplifier - Difference amplifier.

NUCLEAR PHYSICS

Nuclear decay processes & Elementary particles. Alpha-Spectrum: Gamow's theory of alpha-decay. Beta-spectrum: Neutrino hypothesis - Fermi theory of beta-decay - Fermi-Kuri plots - Selection rules for beta-decay. Gamma-emission: Multipole radiation – selection rules for gamma-decay. Classification of elementary particles – Fundamental interactions - conservation laws. Nuclear Radiation & Detection: Interaction of charged particles with matter - Bohr's formula – Belthe's modification Range-Energy relation - Stopping power - Straglling Boremsstralung - interaction of gamma-radiation with matter (photo electric effect, comption effect, pair – production).

SOLID STATE PHYSICS

Crystalline state: Crystal translational vectors - unit cell - Bravais lattices - Crystal systems - Miller indices - symmetry operations - Point groups - Space groups and their notation - Crystal structures of BCC, CsCl, NaCl, HCP, Diamond and ZnS - Bragg's Law, Van Laue treatment of X-ray diffraction and its equivalence with Bragg's law - Atomic structure factor - Geometrical structure factor and Debye Wallar factor - Concept of Reciprocal lattice - Concept of Brillouin zones - Experimental methods of x-ray diffraction of crystals – Laue and Powder methods - Bloch theorem - behaviour of electron in periodioc potentials - Kronig–Penney model - E vs K relation - density of states in a band - effective mass of electron - negative effective mass and concept of hole - Distinction between metals, semiconductors and insulators - Intrinsic semiconductors - band model - Fermi level - Hall effect in semiconductors.

OSMANIA UNIVERSITY
DIRECTORATE OF ADMISSIONS
GENERAL RULES FOR ADMISSION

This booklet contains the general rules, regulations and instructions to the candidates appearing for the entrance test for admission into Post M.Sc. Diploma in Radiological Physics offered by the Department of Physics, Osmania University in collaboration with MNJ Institute of Oncology & Regional Cancer Centre, KIMS Hospital, American Oncology Institute, Omega Hospital and Basavatarakam Indo-Amrican Cancer Centre, all at Hyderabad

INSTRUCTIONS:

I ELIGIBILITY CONDITIONS:

To be Eligible for Admission into **Post M.Sc. Diploma in Radiological Physics** a candidate:

(a) must have passed M.Sc. in Physics with atleast 60% marks.

(b) must have qualified at the Entrance Test conducted by the University in the Academic year for which admission is sought. Qualifying at the Entrance Test alone does not confer a right of admission into the course. In addition to being qualified at the Entrance Test, a candidate will be eligible for admission only if he/she pass the qualifying examination before the commencement of counselling for admission and secures the prescribed minimum marks. He / She must submit the necessary documents listed under item VII of this booklet at the time of counselling. The memorandum of marks and Pass Certificates of the qualifying examination are not called for along with the application form and the eligibility of the candidates is not verified/decided at the time of allowing the candidates to appear for the Entrance Test. Hence, even if candidates are qualified in the Entrance Test, they shall not have any right for admission unless they fulfil the eligibility criteria as laid down in the rules. Candidates are advised to ensure that they fulfil the eligibility criteria for admission to the course he/she has applied, before appearing at the Entrance Test.

II. Filling up the application form:

1. The candidates are required to fill in carefully the application form.
2. Application form should be filled in properly and legibly by the candidate in his/her handwriting
3. The candidate will be held personally responsible for any incorrect entry.
4. Incomplete applications will be summarily rejected.
5. The University reserves the right to cancel the admission at any stage if the particulars furnished by the candidate are found to be incorrect.

III. Submission of the application form:

1. Application form duly filled in should be submitted at the Office of the Directorate of Admissions, O.U. **on or before** the prescribed date and time.
2. Candidates sending the applications by post should post them sufficiently early so that they reach on or before the last date and time prescribed. The University will not be responsible for any postal delay or loss during transit.
3. Xerox of S.S.C. should be enclosed
4. Arrange the application form and enclosures in the following order:

a) Acknowledgement Card
b) Application form (Note: Information brochure supplied along with the application should be retained by the candidate).
c) S.S.C. xerox copy
d) **ICR sheet should not be tagged or pinned to the application.** It should be submitted separately along with the application.

IV ISSUE OF HALL TICKETS:

1. The original Hall Ticket will be sent by post and will not be issued to the candidates in person. The University will not be responsible for non-receipt of Hall Ticket due to postal delay or loss in transit.
2. In case of non-receipt of original Hall Ticket, a duplicate Hall Ticket will be issued to the candidate, only one day before the concerned Entrance Test during office hours, on production of
   i) Acknowledgment Card/Proof of submission of Application Form.
   ii) One passport size photograph, identical to the one affixed to the application form.
   iii) Attested by the Chief Superintendent of the concerned test center atleast one hour before the commencement of the test.
3. No Hall Ticket will be issued on the day of Entrance Test.

V. ENTRANCE TEST:

Admissions into **Post M.Sc. Diploma in Radiological Physics** is made on the basis of entrance test conducted for that purpose. The entrance test paper contains multiple choice objective type questions only and the answers for the questions are to be marked on the **OPTICAL MARK READER (OMR)** answer sheet by **DARKENING** the respective ovals with **Blue/Dark ball point pen.** In addition to qualifying in the entrance test the candidates must fulfil the other eligibility conditions specified for the course for which he/she seeks admission.

VI. DECLARATION OF ENTRANCE TEST RESULTS:

Results of Entrance Test will be displayed on the Notice Board of the Directorate of Admissions and the rank cards will be made available in OU, websites: www.ouadmissions.com and www.osmania.ac.in.

VII. ADMISSIONS:

The eligible candidates will be admitted into Post M.Sc. Diploma in Radiological Physics through Centralised counselling. A prior intimation about counselling schedule will be given to candidates either by post or through OU website or both. The candidates desirous of seeking admission have to attend the counselling in person alongwith the following original certificates and two sets of xerox copies.

1. Rank Card: 2025
2. Entrance Test Hall Ticket**:** 2025
3. **Transfer certificate (T.C.) from the Institution where the candidate studied last. If the candidate is pursuing any course during the academic year 2025-2025, either regular or correspondence, he/she must submit a proof of admission (certificate issued by the Head of the Institution) and will have to submit the T.C. from the present course within seven (7) days. Otherwise the admission is deemed to be cancelled. An undertaking has to be given by the candidate to this effect.**
4. Original certificate (or provisional certificate if the original is not yet issued as per rules) of the qualifying examination.
5. Consolidated Memorandum of Marks of the qualifying examination.
6. Secondary School Certificate (S.S.C.)
7. Proof of Local/Non-Local candidates, according to rules in force. Those who have studied Degree and P.G. courses as regular students need submit only the bonafide certificates from colleges where they have studied the said courses. In case the candidates have studied four consecutive years preceding the qualifying examination in more then one local area, the candidates must submit bonafide certificate(s) of Intermediate (In addition to the above). In case the candidate has not studied in any educational institution during part of 4/7 years preceding the qualifying examination, he/she has to submit a gap certificate from the MRO concerned.
8. Community, Nativity and Date of Birth Certificate for S.C., S.T., B.C., candidates as per G.O.Ms.No. 58, Social Welfare (J) Dept, dated 12-5-1997 issued by Tahasildar.

The candidates will be admitted based on the ranks secured in the Post M.Sc. Diploma in Radiological Physics Entrance Test. In case of a tie in the rank, the order of merit will be decided on the following basis

1. Marks secured in part-A of entrance test, 2. Age of the candidate (senior in age gets higher priority). 3. Percentage of marks secured in qualifying examination,

The eligible candidates will be called for counseling in the order of their ranks for centralized admission. **The eligible candidates are required to submit all relevant certificates and pay the required fee on the spot. No candidate will be admitted without the fulfillment of the above requirements.**

In case, for administrative reasons, the counseling for category seats (BC, SC, ST, Women and Special) is conducted/ahead of general category, the candidates admitted under the category can also attend the counseling conducted for general category as per their ranks to derive advantage, if any.

VIII. RESERVATION

1. **Local and Non-Local Candidates**
   i) Admission to 85% of the available seats in every course shall be reserved in favour of the local candidates in relation to the local area in respect of O.U. subject to community and other reservations in force.
   ii) The remaining 15% of the seats which are open to local and non-locals shall be filled up subject to similar reservation as applicable to 85% local candidates (See annexure I & II for details).
2. **S.C., ST. and B.C. candidates**: Of the total number of seats available in each subject/course, following is the schedule of reservation of seats for these categories.

Scheduled Tribe ... 10 percent
Schedules Caste ... 15 percent (SC-I: 1 percent, SC-II: 9 percent & SC-III: 5 percent)

Backward Class

Group	A	7 percent
Group	B	10 percent
Group	C	1 percent
Group	D	7 percent
Group	E	4 percent (subject to court judgment)

Note:

1. The genuineness or otherwise of the social status claim of the candidates seeking admission under SC/BC categories shall be verified by the Director of Social Welfare/Director of Backward Classes of Government of T.G., respectively, whose decision in this regards will be final. The admissions to the seats reserved for SC/BC shall be deemed provisional till the genuineness of the social status of the candidates is verified by the respective authorities cited above.
2. In the case of ST candidates, they should get their status verified by the Director of Tribal Welfare, Government of T.G., Telugu Samskhema Bhavan, Masab Tank, Hyderabad - 20 before attending the spot admission, if necessary.
3. S.C. S.T., & B.C. candidates who get seats by merit in General Category will not be counted against the seats reserved for them and such candidates will go into the list of general seats.
4. While filling up the seats reserved for Backward class-A the qualified Backward Class-A candidates should be considered in the order of merit after filling up the un-reserved seats. If qualified Backward Class-A candidates are not available, the turn will go to Backward Class-B, Backward Class-C and Backward Class-D in the order of merit in each group". If no suitable candidate is available in any of the four groups, the seats shall be filled up from general pool on the basis of merit.
5. If sufficient number of candidates are not available to fill up the seats reserved for S.C's they shall be filled up by suitable candidates from S.T's and vice versa. If the required number of candidates are not available for filling the quota of seats reserved for S.Cs & S.Ts they may be filled up by candidates from the general pool on the basis of merit.

IX Wherever applicable, a minimum of 33 1/3% of the available seats in each Post-graduate course will be allotted to women candidates from each category i.e., open S.C. , S.T., BCs Groups A,B,C,D taking each college for a subject as a unit. This rule is not applicable (i) If women candidates selected on merit in each category form 33 1/3% or more of the seats therein; and (ii) for seats under various special categories. In the absence of suitable women candidates in the respective categories, these seats shall be filled in with men candidates of the same category.

X. NATIONALITY:
All candidates shall be of Indian Nationality and shall fall under the category of Local/Non-local (as defined in Annexure-I) except where otherwise stated.

XI. MEDIUM OF INSTRUCTION: The medium of instruction and examination is English.

XII. ATTENDANCE:
Candidates once admitted are required to put in not less than 75% of attendance in lectures (and practical wherever applicable). The Vice-chancellor, on the specific recommendation of the Principal/Head of the Department, may condone the deficiency in attendance to the extent of 10% on medical grounds, subject to production of Medical Certificate and on payment of the prescribed condensation fee.

XIII. No hostel accommodation is available to the candidates admitted into Post M.Sc. Diploma in Radiological Physics.

XIV. PROHIBITION OF SIMULTANEOUS STUDY:
Candidates are not permitted to pursue more than one course, at any point of time. If such cases are detected, the admission of the candidate in both the courses will be cancelled at any time.

XV. Conduct and discipline rules for the students are obligatory as per section 46 of O.U. Act 1959.

ANNEXURE – I

RESERVATION OF SEATS UNDER LOCAL AND NON- LOCAL CATEGORY

(G.O. Ms. No. 15, Higher Education (TE) Department, Dated: 27-02-2025)

Admission to 85% of the seats shall be reserved in each course in the Educational Institutions in the State for local candidates of OU area as specified in the Andhra Pradesh Educational Institutions (Regulations and Admissions) Order, 1974 as subsequently amended and the remaining 15% of the seats shall be un-reserved seats to the following:

a. All the candidates eligible to be declared as local candidates of O.U. area.

b. Candidates who have resided in the State for a total period of ten years excluding periods of study outside the State or either of whose parents have resided in the State for a total period of ten years excluding periods of employment outside the State;

c. Candidates who are children of parents who are in the employment of this State or Central Government, Public Sector Corporations, Local Bodies, Universities and other similar quasi- public institutions within the State; and

d. Candidates who are spouses of those in the employment of the State or Central Government Public Sector Corporations, Local Bodies, Universities and educational institutions recognized by the Government or a University or other competent authority and similar other quasi-Government institutions within the State.