



OFFICE OF THE PROFESSOR AND HOD,  
REGIONAL CANCER CENTRE,  
DEPARTMENT OF RADIATION ONCOLOGY  
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M.C. /R.O.D. / No/ 2025/ 997

Dated 25/07/2025

To,

The Registrar  
Pt D.D.U. Memorial Health Science and Ayush University  
Nava Raipur (C.G.)

Subject: - Request for Submission of Radiation Oncology Syllabus for Ph.D. Entrance Test.

Reference:- Your Letter No./2289/DUHS/2025, Raipur, Dated: 18-07-2025.

Sir,

In reference to above cited letter, Please find inclosed here with Radiation Oncology Syllabus for Ph.D. Entrance Test. Kindly do the needful.

Encloser: As Above.

*elb2*  
25/7/25

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## Specific Coursework and Practical Training in Oncology PhD Programs

Oncology PhD programs combine foundational coursework, advanced electives, and extensive practical and research training. The structure and emphasis can differ by country and institution, but all programs aim to build strong expertise in cancer biology, research methods, and clinical understanding.

### Coursework

#### Common Core Courses


- Cancer Biology:\* Cellular and molecular mechanisms of cancer, tumor progression, metastasis.
- Molecular and Cell Biology:\* Signaling pathways, gene regulation, and genetic mutations relevant to oncology.
- Biostatistics and Data Analysis:\* Statistical techniques for experimental and clinical data.
- Research Methodology:\* Experimental design, hypothesis testing, scientific writing, and ethics.
- Immunology:\* Cancer immunology, tumor-immune system interactions, immunotherapy.
- Pathology:\* Mechanisms of disease, diagnostic histopathology, molecular pathology.
- Epidemiology:\* Basics of cancer epidemiology, risk factors, and population studies.

#### Advanced and Elective Subjects

- Advanced Cancer Genetics and Genomics
- Cancer Therapeutics (targeted therapy, chemotherapy, radiotherapy)
- Tumor Microenvironment and Angiogenesis
- DNA Repair Mechanisms
- Stem Cell Biology and Regenerative Medicine
- Translational Oncology (from bench to bedside)
- Bioinformatics and Big Data in Cancer Research

#### Supporting Courses

- Scientific Communication and Research Ethics
- Seminar Series and Journal Clubs
- Clinical Oncology Orientation

  
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## **Practical Training**

### **Laboratory Rotations**

- Hands-on work in multiple cancer research labs
- Exposure to diverse research techniques (cell culture, flow cytometry, gene editing,)
- Advanced biochemical and molecular biology techniques

### **Research Project**

- A major component involving independent experimental research under faculty supervision
- Proposal development, experimental execution, data analysis, and thesis writing

### **Workshops and Seminars**

- Clinical case conferences
- Methods workshops (e.g., imaging)
- Participation in scientific conferences and symposia

### **Clinical Integration (where available)**

- Shadowing oncologists or participation in tumor boards
- Clinical sample handling (biopsies, blood, and tissue samples)
- Translational modules linking research with patient care

### **Assessment Methods**

- Written and oral examinations covering coursework
- Research progress presentations and milestone exams
- Thesis defense and publication requirements

### **Key Takeaways:**

- All oncology PhD programs combine coursework and hands-on training, but US/UK programs often emphasize research from the outset with flexible or optional coursework, while Indian programs usually begin with more structured courses and formal lab skills training.
- Across programs, the unifying theme is a blend of cancer biology, research methodology, advanced specialties, and continual practical laboratory experience alongside research.

*25/2/25*  
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