Radiation therapy (or radiation oncology) is the medical use of ionizing radiation to treat cancer and control malignant cell growth. Radiation therapy is commonly combined with other modes of treatment for cancer, such as surgery, chemotherapy, and hormone therapy. Radiation therapists should be able to think critically, work with computers, and be able to work on a treatment team. Patient care and empathy are also important assets. It is intended for radiographers who seek additional specialization.

Mission

The mission of the Bachelor of Science in Radiation Therapy Program is to prepare professionals in the field of radiation therapy who have received broad education and training in all aspects of the profession. This will include critical thinking, clinical competence, effective communication, and professionalism as they apply to the field of radiation therapy. The program encourages intellectual, physical, social, and spiritual development by emphasizing these goals in its curriculum, which is reflected in the motto of Loma Linda University Health—"To Make Man Whole".

Program goals and student learning outcomes (SLOs)

1. Student will demonstrate critical thinking.
   a. Student will be able to monitor change in patient condition.
   b. Student will be able to interpret isocenter shift from CT sim data to treatment-planning data.

2. Student will be clinically competent.
   a. Student will perform daily QA.
   b. Student will be able to check that dosimetry data is acutely transferred to electronic chart.
   c. Student will be able to recognize treatment changes.

3. Student will be able to communicate effectively in English.
   a. Student will demonstrate effective verbal communications skills.
   b. Student will demonstrate effective written communication skills.

4. Student will demonstrate professionalism.
   a. Student will treat all persons with respect.
   b. Student will demonstrate knowledge of HIPPA.
   c. Student will demonstrate responsibility and accountability for actions.

5. For JRCERT requirements the program will achieve the following:
   a. Students will complete the program.
   b. Graduates will pass the ARRT examination.
   c. Graduates will have job placement within six months.

CPR certification

Students are required to have current health-care provider cardiopulmonary resuscitation (CPR) certification (adult, child, and infant) for all scheduled clinical experience. CPR certification must be completed at the American Heart Association health-care provider level. This must be completed prior to beginning the program of study. Classes are available on campus at Life Support Education, University Arts building, 24887 Taylor Street, Suite 102.

Accreditation

The program is accredited by the Joint Review Committee on Education in Radiologic Technology, 20 North Wacker Drive, Suite 900, Chicago, IL 60606-2901; telephone: 312/704-5300.

Admissions

Admission is based on a selective process. In addition to Loma Linda University (http://llucatalog.llu.edu/about-university/admission-policies-information/#admissionrequirementstext) and School of Allied Health Professions admissions requirements (http://llucatalog.llu.edu/allied-health-professions/#generalregulationstext), the applicant must also complete the following requirements:

- Prerequisite courses met
- Must be either an ARRT registered radiographer (two-year minimum degree) or a Registered Nurse or graduate of an accredited Allied Health Program with patient care experience (2-year minimum degree) and complete the following subjects at an accredited college or university prior to entering the program
- 40 hours of career observation in a Radiation Oncology Department
- GPA of 3.0 or better, higher is more competitive
- Current BLS with American Heart Association, adult and child
- Admissions essay
- Interview
- Must have the following courses:

Prerequisite courses

Applicants must complete the following subjects at an accredited college or university prior to entering the program. Please note: C- grades are not transferable for credit.

Humanities – 20 units minimum are needed prior to program entry.
Choose a minimum of three areas from the following subjects: history, literature, philosophy, foreign language, art/music appreciation/history. Included in this minimum are 4 units of religion per year of attendance at a Seventh-day Adventist college or university. Eight units of religion are included in the B.S. degree core as a co-requisite. A total of 28 quarter units are required to fulfill this area.

Natural Sciences – The study of natural sciences must include a minimum of 12 units.

- Human anatomy and physiology with laboratory, complete sequence
- College algebra (Pre-calculus will be required starting 2017-2018)
- Selected from the following content areas: biology, chemistry, geology, mathematics, physics, and statistics.

Social Science – must have a total of 12 quarter units of social science.
· General psychology
· Select additional units from: economics, geography, political science, psychology, sociology, or anthropology.

**Communication** – A minimum of 9 units are needed to complete this area
· English composition, complete sequence

**Health and Wellness** – Personal health or nutrition and two physical activity courses are required to meet the minimum of 3 quarter units.

**Other required courses:**
· Medical terminology
· Patient-care methods
· Radiation physics, radiation protection, principles of radiography (available in the professional program for those who do not have it)

**Electives** – may be needed to meet the minimum requirements of 192 quarter units. A minimum of 68 quarter units must be taken from general education areas listed above (i.e. humanities, natural sciences, social sciences, communication, and health and wellness).

· ARRT-certified students will earn 90 units in the program.
  (prerequisite units required: 102 quarter/68 semester)
· non-ARRT-certified students will earn 102 units in the program.
  (prerequisite units required: 90 quarter/60 semester)

For total unit requirements for graduation, see LLU General Education Requirements (http://llucatalog.llu.edu/about-university/division-general-studies/#courserequirementstext).

### Program requirements

#### ARRT certified students

**First Year**

**Autumn Quarter**
- AHCJ 493 Senior Portfolio I 3
- RTTH 344 Radiation Therapy Procedures 2
- RTTH 355 Physical Principles of Radiation Therapy I 3
- RTTH 364 Radiation Oncology I 2
- RTTH 371 Radiation Therapy Affiliation I 2

**Winter Quarter**
- RTCH 387 Writing for Health-Care Professionals 3
- RTTH 342 Patient-Care Practices in Radiation Therapy 2
- RTTH 356 Physical Principles of Radiation Therapy II 2
- RTTH 365 Radiation Oncology II 3
- RTTH 372 Radiation Therapy Affiliation II 2

**Spring Quarter**
- AHCJ 403 Pathology II 4
- AHRM 475 Health-Care Research and Statistics 4
- RTTH 332 Radiation Biology 2
- RTTH 357 Applied Dosimetry 2
- RTTH 366 Radiation Oncology III 2
- RTTH 373 Radiation Therapy Affiliation III 3

**Second Year**

**Summer Quarter**
- AHCJ 318 Emotional Intelligence and Leadership Skills for Health-Care Professionals 3
- RELR 415 Christian Theology and Popular Culture 2
- RTTH 354 Quality Assurance in Radiation Therapy 2
- RTTH 474 Radiation Therapy Affiliation VII 5

**Autumn Quarter**
- RTSI 367 Cross-sectional Radiographic Anatomy 2
- RTSI 369 CT Physics 2
- RELT 423 or 436 Loma Linda Perspectives 2
- RTTH 475 Radiation Therapy Affiliation V 5

**Winter Quarter**
- REL_ 4__ Upper-division religion elective 2
- RTCH 464 Moral Leadership 4
- RTCH 467 Management of a Radiologic Service 3
- RTSI 364 CT Patient Care and Procedures 2
- RTTH 476 Radiation Therapy Affiliation VI 4

**Spring Quarter**
- AHCJ 494 Senior Portfolio II 3
- REL_ 4__ Upper-division religion elective 2
- RTTH 348 Radiation Therapy Review 2
- RTTH 477 Radiation Therapy Affiliation VII 4

**Total Units:** 90

### Non-ARRT certified students

**First Year**

**Summer Quarter**
- AHCJ 326 Fundamentals of Health Care 2
- RTCH 283 Basic Imaging 2
- RTCH 283L Radiation Clinical Basics Laboratory 1
- RTCH 285 The Principles and Physics of Radiation 4
- RTMR 224 Legal Issues in Medical Radiography 1
- RTMR 284 Radiation Protection and Biology 2

**Autumn Quarter**
- AHCJ 493 Senior Portfolio I 3
- RTTH 344 Radiation Therapy Procedures 2
- RTTH 355 Physical Principles of Radiation Therapy I 3
- RTTH 364 Radiation Oncology I 2
- RTTH 371 Radiation Therapy Affiliation I 2

**Winter Quarter**
- RTCH 387 Writing for Health-Care Professionals 3
- RTTH 342 Patient-Care Practices in Radiation Therapy 2
- RTTH 356 Physical Principles of Radiation Therapy II 2
- RTTH 365 Radiation Oncology II 3
- RTTH 372 Radiation Therapy Affiliation II 2

**Spring Quarter**
- AHCJ 403 Pathology II 4
- AHRM 475 Health-Care Research and Statistics 4
- RTTH 332 Radiation Biology 2
- RTTH 357 Applied Dosimetry 2
- RTTH 366 Radiation Oncology III 2
- RTTH 373 Radiation Therapy Affiliation III 3
Second Year

Summer Quarter

AHCJ 318  Emotional Intelligence and Leadership Skills for Health-Care Professionals  2
REL R 415 Radiation Therapy Affiliation VII  3
RTTH 347 Radiation Therapy Review  2
RTTH 354 Quality Assurance in Radiation Therapy  2

Autumn Quarter

REL 423 or REL R 415 Christian Theology and Popular Culture  3
RTSI 367 Cross-sectional Radiographic Anatomy  2
RTSI 369 CT Physics  2
RTTH 475 Radiation Therapy Affiliation V  4

Winter Quarter

REL_ 4__ Upper-division religion elective  4
RTCH 464 Moral Leadership  2
RTCH 467 Management of a Radiologic Service  3
RTSI 364 CT Patient Care and Procedures  2
RTTH 476 Radiation Therapy Affiliation VI  4

Spring Quarter

AHCJ 494 Senior Portfolio II  3
REL_ 4__ Upper-division religion  2
RTTH 348 Radiation Therapy Review  2
RTTH 477 Radiation Therapy Affiliation VII  4

Total Units: 102

1 May be substituted with another RELR course

A minimum grade of C (2.0) is required for all courses in this program.

Courses

RTTH 332. Radiation Biology. 2 Units.
The effects of radiation on living systems.

RTTH 342. Patient-Care Practices in Radiation Therapy. 2 Units.
Aspects of radiation therapy patient care. Emphasizes equipment, treatment, and psychological support of the patient. Transmission and prevention of AIDS and other communicable diseases, with specific application to radiation therapy.

RTTH 344. Radiation Therapy Procedures. 2 Units.

RTTH 348. Radiation Therapy Review. 1,2 Unit.
Comprehensively reviews radiation physics, protection, and dosimetry. Applies radioactive materials. Radiobiology. Technical aspects of radiation oncology. Students beginning in Autumn of 2016 are required to take this course for two units.

RTTH 354. Quality Assurance in Radiation Therapy. 2 Units.
Focuses on all components of quality improvement programs operating in radiation oncology. Emphasizes development of a culture of safety through continuous quality improvement (CQI) for the clinical and technical aspects of patient care, including treatment delivery and localization equipment, treatment planning equipment, and electronic medical records. Discusses the role of various radiation therapy team members in CQI, as well as the legal and regulatory implications for providing a radiation oncology service.

RTTH 355. Physical Principles of Radiation Therapy I. 3 Units.

RTTH 356. Physical Principles of Radiation Therapy II. 3 Units.
Discusses the following areas: calibration techniques of photon, particulate, and electron beams; percentage depth dose, tissue-air ratios, treatment planning, scatter functions, field flatness, and symmetry, field shaping, arc therapy, and tissue inhomogeneities; and clinical dosimetric considerations. Includes laboratory. Prerequisite: RTTH 364, RTTH 365.

RTTH 357. Applied Dosimetry. 2 Units.
Brachytherapy sources, isotope calibration, protection, and implantation techniques. Teletherapy equipment and protection. Quality assurance for external and brachytherapy procedures. Laboratory.

RTTH 364. Radiation Oncology I. 2 Units.
A three-term course covering pathology, etiology, epidemiology, histopathology, metastasis, staging, and treatment of major types of malignant neoplasms. Includes technique/simulation laboratory.

RTTH 365. Radiation Oncology II. 2 Units.
A three-term course covering pathology, etiology, epidemiology, histopathology, metastasis staging, and treatment of major types of malignant neoplasms. Prerequisite: RTTH 364.

RTTH 366. Radiation Oncology III. 2 Units.
The third in a three-quarter course covering pathology, etiology, epidemiology, histopathology, metastasis, staging, and treatment of major types of malignant neoplasms.

RTTH 371. Radiation Therapy Affiliation I. 2 Units.
First of seven clinical affiliations.

RTTH 372. Radiation Therapy Affiliation II. 3 Units.
Continues RTTH 371.

RTTH 373. Radiation Therapy Affiliation III. 3 Units.
Continues RTTH 371, 372.

RTTH 473. Radiation Therapy Affiliation VI. 4 Units.
Continues RTTH 371-371, 471-472.

RTTH 474. Radiation Therapy Affiliation VII. 5 Units.
Continues RTTH 371-373.

RTTH 475. Radiation Therapy Affiliation V. 5 Units.
Continues RTTH 371-373, 474-475.

RTTH 476. Radiation Therapy Affiliation VI. 4 Units.
Continues RTTH 371-373, 474-475.

RTTH 477. Radiation Therapy Affiliation VII. 4 Units.
Continues RTTH 371-373, 474-476.

RTTH 974. Radiation Therapy Affiliation IV. 12 Units.
Continues RTTH 971-973.
RTTH 975. Radiation Therapy Affiliation V. 11 Units.
Continues RTTH 971-974. Prerequisite: RTTH 971, RTTH 972, RTTH 973, RTTH 974.