RADIATION SCIENCES — B.S.

Program director
Timothy Seavey
Assistant program director
Kathryn Cockrill

The program
The Bachelor of Science degree in radiation sciences provides imaging professionals with the foundational education necessary to advance into various career possibilities, including: advanced imaging modalities; graduate degrees; professional advancement into entry management, education in imaging, and imaging informatics positions.

The baccalaureate degree comprises a minimum of 192 quarter units in the following:

- Loma Linda University general education requirements
- Professional certification in an imaging modality (entry-level imaging degree)
- Radiation science core requirements*
- An area of emphasis: administration*, education*, advanced imaging modalities, science, or imaging informatics*
- E-portfolio that comprises academic and professional work, a signature project, and service learning

*online

Electives to meet the needs of individual students are selected from existing courses after consultation with the program director.

Students have the ability to customize their programs by choosing an area of emphasis for their studies. Emphases include: education, imaging informatics (PACS administration), science, advanced medical imaging, advanced imaging modalities (diagnostic sonography, cardiac sonography, computed tomography, magnetic resonance imaging, cardiac and/or vascular imaging, radiation therapy, nuclear medicine, or dosimetry), or administration. Loma Linda University and the Department of Radiation Technology cannot guarantee employment.

Program objectives
1. Graduate practitioners who are leaders in the profession and who are capable of serving the greater community in the public, private, and nonprofit sectors.
2. Graduate managers, administrators, and educators who contribute to the profession’s body of knowledge through leadership roles, publications, professional presentations, and advocacy.

Program learning outcomes
Upon completion of the curriculum, the graduate should be able to:

1. Develop meaningful interactions in health care
2. Demonstrate moral leadership
3. Discuss health-care advancement and sustainability
4. Apply emotional intelligence and leadership skills

CPR certification
Students taking a clinically-based emphasis are required to have current health-care provider adult, child, and infant cardiopulmonary resuscitation (CPR) certification for all scheduled clinical experience. CPR certification must be completed at the American Heart Association health-care provider level. This may be completed prior to beginning the program of study or be obtained at Loma Linda University. Classes are available on campus at Life Support Education, University Arts building, 24887 Taylor Street, Suite 102; telephone, 909/558-4977.

Accreditation
Loma Linda University is regionally accredited by the WASC Senior College and University Commission (WSCUC), 985 Atlantic Avenue, Suite 100, Alameda, CA 94501; telephone: 510/748-9001; fax: 510/748-9797; website: <http://www.wascsenior.org/contact>.

Admissions
Applicants may be accepted year-round and may enter the B.S. degree program at the start of any quarter. Contact the program director for advisement. 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 meet the following requirements:

- an associate degree or a minimum of 72-96 degree transferable units per program director approval
- be a graduate of an approved program in radiologic technology, computed tomography, magnetic resonance imaging, radiation therapy, nuclear medicine, cardiac and/or vascular imaging, or sonography (ultrasound)
- certification from the American Registry of Radiologic Technologists (ARRT), American Registry for Diagnostic Medical Sonography (AB, BR, FE, OB/GYN, PS, AE, PT, and/or VT), or an equivalent specialty credential.

Applicants who are eligible to take the ARRT (R) or ARDMS specialty examination for certification/credential but who have not had opportunity to do so are given provisional status for one quarter. Eligibility to continue is subject to student’s obtaining certification. The University will not sign or validate registry documents of students who obtained their training in another program.

Prerequisites/corequisites
A maximum of 70 semester or 105 quarter didactic units from an accredited community college will be accepted as transfer credit. Students who have completed a non-regionally accredited program, but is accredited by the same national accrediting agency as LLU’s program, are allowed up to 46 community college-level quarter units of academic credit on the basis of their registry licenses. Students should be within 12 quarter units of completion of general education requirements in order to be considered for the Bachelor of Science core program OR have developed an academic plan with the program director. For a complete listing of general education requirements, see LLU General Education Requirements (http://llucatalog.llu.edu/about-university/division-general-studies/#courserequirementstext). Following is a list of specific requirements and the general education domain to which they apply.

Domain 1: Religion and Humanities (20 quarter or 14 semester units)
Humanities (12-20 quarter or 8-14 semester units)
Selected from at least three of the following content areas: Civilization/history, fine arts, performing/visual arts (not to exceed four quarter units).
Program requirements

Core (30 units)  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHCJ 493</td>
<td>Senior Portfolio I</td>
<td>3</td>
</tr>
<tr>
<td>RTCH 387</td>
<td>Writing for Health-Care Professionals</td>
<td>3</td>
</tr>
<tr>
<td>RTCH 489</td>
<td>Effective Communication for Supervisors</td>
<td>3</td>
</tr>
<tr>
<td>AHCJ 318</td>
<td>Emotional Intelligence and Leadership Skills for Health-Care Professionals</td>
<td>3</td>
</tr>
<tr>
<td>RTCH 464</td>
<td>Moral Leadership</td>
<td>3</td>
</tr>
<tr>
<td>RTCH 485</td>
<td>Digital Management in Radiology</td>
<td>3</td>
</tr>
<tr>
<td>AHCJ 494</td>
<td>Senior Portfolio II</td>
<td>3</td>
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Religion (4 - 16 units)  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>RELT 423</td>
<td>Loma Linda Perspectives (Choose one course)</td>
<td>2</td>
</tr>
<tr>
<td>or RELT 436</td>
<td>Adventist Heritage and Health</td>
<td>2</td>
</tr>
<tr>
<td>or RELT 437</td>
<td>Current Issues in Adventism</td>
<td>2</td>
</tr>
<tr>
<td>or RELT 406</td>
<td>Adventist Beliefs and Life</td>
<td>2</td>
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</tbody>
</table>

Area of emphasis: administration  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTED 474</td>
<td>Instructional Techniques for the Radiation Sciences</td>
<td>3</td>
</tr>
<tr>
<td>HCAD 374</td>
<td>Health-Care Human Resources</td>
<td>3</td>
</tr>
<tr>
<td>HCAD 465</td>
<td>Health-Care Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>HCAD 401</td>
<td>Health-Care Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>HCBL 346</td>
<td>Legal and Ethical Environment in Health Care</td>
<td>3</td>
</tr>
<tr>
<td>RTCH 413</td>
<td>Management Practicum I</td>
<td>3</td>
</tr>
<tr>
<td>RTII 358</td>
<td>PACS Planning and Implementation</td>
<td>3</td>
</tr>
<tr>
<td>RTCH 418</td>
<td>Health Information Management and Radiology Coding for Radiology Managers</td>
<td>3</td>
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</table>

Total Units: 24

Area of emphasis: education  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTED 415</td>
<td>Teaching Practicum in the Radiation Sciences</td>
<td>3</td>
</tr>
<tr>
<td>RTED 474</td>
<td>Instructional Techniques for the Radiation Sciences</td>
<td>3</td>
</tr>
<tr>
<td>RTED 475</td>
<td>Curriculum Development for the Radiation Sciences</td>
<td>3</td>
</tr>
<tr>
<td>RTED 476</td>
<td>Adult Learning Theory for the Radiation Science Student</td>
<td>3</td>
</tr>
<tr>
<td>RTED 477</td>
<td>Learning Activities and Assessment for the Radiation Sciences</td>
<td>3</td>
</tr>
<tr>
<td>RTED 484</td>
<td>Learning Environments for Radiation Science Students</td>
<td>3</td>
</tr>
<tr>
<td>RTED 485</td>
<td>Digital Design for the Radiation Sciences</td>
<td>3</td>
</tr>
<tr>
<td>RTED 487</td>
<td>Issues in Radiation Sciences</td>
<td>3</td>
</tr>
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</table>

Total Units: 24

Area of emphasis: imaging informatics  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTED 474</td>
<td>Instructional Techniques for the Radiation Sciences</td>
<td>3</td>
</tr>
<tr>
<td>RTII 354</td>
<td>Introduction to Informatics</td>
<td>3</td>
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</table>

Total Units: 24

Additional notes:  

1. Core courses are available on campus and online.  
2. Students are required to take one of the required RELT courses listed above. Total units required are based on the percentage of course work from an SDA college/university. The maximum requirement is 16 units, including transfer units.  
3. Select from options listed below.  
4. Remaining units required to fulfill the 192 units required for the baccalaureate degree may be obtained from remaining emphases and other available courses offered at Loma Linda University.
Area of emphasis: cardiovascular imaging (CVI)
Students may select CI, VI, or both.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHCJ 402</td>
<td>Pathology 1, 2</td>
<td>4</td>
</tr>
<tr>
<td>CEPT 245</td>
<td>Cardiovascular Anatomy and Physiology</td>
<td>3</td>
</tr>
<tr>
<td>CEPT 248</td>
<td>Cardiovascular Patient Assessment</td>
<td>2</td>
</tr>
<tr>
<td>CEPT 251</td>
<td>Cardiac Electrophysiology and Rhythm Recognition I</td>
<td>2</td>
</tr>
<tr>
<td>CEPT 252</td>
<td>Cardiac Electrophysiology and Rhythm Recognition II</td>
<td>2</td>
</tr>
<tr>
<td>CEPT 275</td>
<td>Cardiovascular Pharmacology 1</td>
<td>3</td>
</tr>
<tr>
<td>RTSI 344</td>
<td>Interventional Pharmacology 2</td>
<td>4</td>
</tr>
<tr>
<td>RTSI 345</td>
<td>Cardiac/Interventional Procedures 1</td>
<td>3</td>
</tr>
<tr>
<td>RTSI 351</td>
<td>Angio/Interventional Procedures I</td>
<td>3</td>
</tr>
<tr>
<td>RTSI 352</td>
<td>Angio/Interventional Procedures II</td>
<td>3</td>
</tr>
<tr>
<td>RTSI 356</td>
<td>Vascular Anatomy and Physiology 2</td>
<td>3</td>
</tr>
<tr>
<td>RTSI 358</td>
<td>CVI Review Course 1, 2</td>
<td>2</td>
</tr>
<tr>
<td>Total Units</td>
<td></td>
<td>34</td>
</tr>
</tbody>
</table>

1 Required for cardiac interventional (CI).
2 Required for vascular interventional (VI).

Area of emphasis: Special Imaging CT/MRI
Students may select CT, MRI, or both.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTSI 361</td>
<td>MRI Physics I</td>
<td>2</td>
</tr>
<tr>
<td>RTSI 362</td>
<td>MRI Physics II</td>
<td>2</td>
</tr>
<tr>
<td>RTSI 364</td>
<td>CT Patient Care and Procedures 1</td>
<td>2</td>
</tr>
<tr>
<td>or RTMR 306</td>
<td>Introduction to Computed Tomography II</td>
<td></td>
</tr>
<tr>
<td>RTSI 365</td>
<td>MRI Patient Care and Procedures</td>
<td>2</td>
</tr>
<tr>
<td>RTSI 367</td>
<td>Cross-sectional Radiographic Anatomy 1</td>
<td>2</td>
</tr>
<tr>
<td>or RTSI 307</td>
<td>Introduction to Computed Tomography</td>
<td></td>
</tr>
<tr>
<td>RTSI 369</td>
<td>CT Physics 1</td>
<td>2</td>
</tr>
<tr>
<td>or RTMR 305</td>
<td>Introduction to Computed Tomography I</td>
<td></td>
</tr>
<tr>
<td>Total Units</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

1 The CT sequence (RTSI 364, RTSI 367, RTSI 369) may be substituted with the CT sequence (RTMR 305, RTMR 306, RTSI 307) completed by LLU's ASMR students.

Area of emphasis: Science (15-20 units)
15-20 quarter units selected from the natural sciences in the areas of biology, microbiology, chemistry, math, or physics. Courses must be taken from two different content areas with the approval of the program director. Introductory sequences are not accepted. These courses are taken at your local college/university. A minimum grade of C+(2.3) is required for all courses.

Area of emphasis: Clinical Practice (12-31 units)
The didactic (not including clinical units) coursework from a clinically-based imaging specialty (from the list below) may be transferred into a clinical practice emphasis. Any clinical practice emphasis requires licensure from the ARRT, NMTCB, or ARDMS

- Diagnostic Sonography (ARDMS)
- Cardiac Sonography (ARDMS)
- Nuclear Medicine (NMTCB and/or ARRT)
- Special Imaging (Computed Tomography and/or Magnetic Resonance Imaging). Students with special imaging coursework totaling less than 12 units must take additional science or didactic emphasis courses to complete the emphasis. Courses must be approved by the program director. (ARRT)
- Radiation Therapy Technology (ARRT)
- Cardiac Interventional and/or Vascular Interventional (ARRT)

Normal time to complete the program
Four (4) years - Two (2) years ([6] academic quarters) at LLU - based on full-time enrollment; part time permitted.