

## Program Number 10-624-1 Associate Degree in Applied Science • Four Terms

### ABOUT THE PROGRAM

The Nuclear Technology program offers the student a unique opportunity to obtain the specialized training in demand by the nuclear power industry and organizations licensed to utilize radioactive materials. The increasing use of radiation and radioactive materials in today's world has created a demand for radiation protection technicians. This program can result in starting salaries higher than many four-year degree programs. It is also an excellent springboard for a four-year degree in the high-demand field of health physics and radiation safety.

### PROGRAM OUTCOMES

- Work safely within industrial and radiological hazard areas.
- Understand and communicate nuclear technology-related concepts effectively in both oral and written formats.
- Diagnose equipment requiring electrical or mechanical repair and carry out preventive maintenance procedures.
- Perform radiological surveys for radiation and radioactive contamination.
- Follow procedures for operating and maintaining systems and equipment at nuclear facilities.
- Participate in applying nuclear technologies to a variety of industrial, medical, and research processes.
- Apply knowledge in a variety of related occupational jobs such as reactor plant operations, maintenance, quality assurance, etc.

### CAREER AND EDUCATION ADVANCEMENT OPPORTUNITIES

LTC credits transfer to over 30 universities. For more information visit [gotoltc.edu/future-students/transfer](http://gotoltc.edu/future-students/transfer).

### ADMISSION AND PROGRAM ENROLLMENT STEPS

- Submit online application.
- Submit transcripts (high school & other colleges). NOTE: Official transcripts required for acceptance of transfer credits; Financial Aid may require.
- Complete the online Student Success Questionnaire.
- Schedule a Program Advising Session with your assigned advisor to plan your first semester schedule, review your entire plan of study, discuss the results of the Student Success Questionnaire.

### APPROXIMATE COSTS

- \$138.90 per credit tuition (WI resident) plus \$8.33 per credit student activity fee. \$10 per credit online, iFlex or hybrid fee. Material fee varies depending on course. Other fees vary by program. Visit [gotoltc.edu/financial-aid/tuition-and-fees](http://gotoltc.edu/financial-aid/tuition-and-fees) for details.

### FINANCIAL AID

This program is eligible for financial aid. Visit [gotoltc.edu/Financial-Aid](http://gotoltc.edu/Financial-Aid) or talk with your Admissions Advisor about how to apply for aid.

### SPECIAL NOTE

- Lectures are taught at LTC's main campus and are accessible for distant students through synchronous videoconferencing via their computer and a 5Mb bandwidth. Labs are available at LTC's main campus and BTC's Milton campus.
- This program meets all the instructional standards and criteria of the Nuclear Uniform Curriculum Program (NUCP).
- Gaining employment in the nuclear, radiation safety, and health physics likely includes a very comprehensive background check of one's lifespan. This includes not only criminal activities, but likely also credit history, civil actions, and a psychological profile.
- Online Option: Available to working adults in the Nuclear/Radiation Safety/Health Physics industry. To register for online courses, search for the catalog numbers and the online option. Online courses have prerequisites. Online students work with their industry supervisor to identify suitable activities at their worksite to enhance their learning.

### CONTACT

LTC Admissions Advisor  
920.693.1162 • [CareerCoach@gotoltc.edu](mailto:CareerCoach@gotoltc.edu)

Catalog No.	Class Title	Credit(s)
<b>Term 1</b>		
10624105	Health Physics Calculations and Statistics	3
10624110	Radioactivity and Regulations	3
10804113	College Technical Mathematics 1A OR 10804198 Calculus 1** (4 cr)	3
10103121	Excel – Level 1	1
10801195	Written Communication	3
		<b>13</b>
<b>Term 2</b>		
10624114	Nuclear Systems and Sources	3
10624122	Radiation Physics	3
10624123	Radiation Physics-Lab	2
10624103	Nuclear DC and AC Applications	3
10801196	Oral/Interpersonal Communications	3
		<b>14</b>
<b>Summer</b>		
10624118	Radiation Biology	3
10809122	Introduction to American Government	3
		<b>6</b>
<b>Term 3</b>		
10624138	Radioactive Materials Management	2
10624149	Reactor Plant Components	4
10482135	Energy Power and Force OR 10806154 General Physics 1 (4 cr)	3
10624145	Applied Health Physics	3
10624146	Applied Health Physics Lab OR 10624156	2
10809198	Radiation Safety Internship Introduction to Psychology	3
		<b>17</b>
<b>Term 4</b>		
10624140	Radiochemistry	3
10624148	Reactor Theory and Operation	3
10624133	Radiological Emergencies	3
10624134	Radiation Shielding	2
10624135	Radiation Shielding Lab	1
		<b>12</b>
		<b>TOTAL 62</b>

\*\*Students who plan to also achieve a Bachelor's degree are encouraged to take this transferable course.

*Curriculum and Program Acceptance requirements are subject to change. Program start dates vary; check with your advisor for details. The tuition and fees are approximate based on 2020-2021 rates and are subject to change prior to the start of the academic year.*



**APPLIED HEALTH PHYSICS...**prepares learner to wear dosimeter, monitor personal exposure, calculate/estimate radioactive airborne activity concentration, issue respirators, determine contamination levels, don and remove protective clothing, reduce the spread of contamination, conduct an ALARA audit, reduce the total radiation exposure, maintain records and estimate skin dose, etc. PREREQUISITE: 10624122 Radiation Physics

**APPLIED HEALTH PHYSICS-LAB...**expands learner's ability to perform applied health physics tasks as covered in Applied Health Physics, 624-145 and should be completed within the same semester. COREQUISITE:10624145 Applied Health Physics

**COLLEGE TECHNICAL MATHEMATICS 1A...**prepares the student to solve linear, quadratic, and relational equations; graph; formula rearrangement; solve systems of equations; percent; proportions; and operations on polynomials. Emphasis will be on the application of skills to technical problems. PREREQUISITES: 10834110 Elementary Algebra w Apps or 10804107 College Mathematics or 31457318 Ind Mtn Trades Math or 31420320 Machine Tool Math or math placement assessment equivalent

**ENERGY POWER AND FORCE...**studies the laws and theories of electric power generation that govern motion and how to apply them to a range of concepts including rotational inertia, acceleration, velocity, lift, force, torque, etc. Studies the law of Conservation of Energy and basic atomic theory and how these concepts apply to electric power generation. The use and function of simple machines, and how they relate to electric power generator function, is also explored.

**EXCEL - LEVEL 1...**introduces the student to spreadsheet features such as creating, saving, editing, navigating, formatting worksheets; entering formulas and functions; working with charts; and developing multiple-sheet workbooks.

**HEALTH PHYSICS CALCULATIONS AND STATISTICS...**prepares the learner to solve linear and exponential equations, logarithms, plot graphs, determine counting statistics and instrument reliability, and work with geometry and trigonometry problems. COREQUISITE: 10624110 Radioactivity and Regulations

**INTRODUCTION TO AMERICAN GOVERNMENT...**introduces American political processes and institutions. It focuses on rights and responsibilities of citizens and the process of participatory democracy. Learners examine the complexity of the separation of powers and checks and balances. It explores the role of the media, interest groups, political parties and public opinion in the political process. It also explores the role of state and national government in our federal system. COREQUISITE: 10838105 Intro to Reading and Study Skills or Reading placement assessment equivalent

**INTRODUCTION TO PSYCHOLOGY...**introduces students to a survey of the multiple aspects of human behavior. It involves a survey of the theoretical foundations of human functioning in such areas as learning, motivation, emotions, personality, deviance and pathology, physiological factors, and social influences. It directs the student to an insightful understanding of the complexities of human relationships in personal, social, and vocational settings. PREREQUISITE: Reading placement assessment equivalent or COREQUISITE: 10838105 Intro to Reading and Study Skills

**NUCLEAR DC AND AC APPLICATIONS...**prepares nuclear, radiation safety, and health physics learners to apply direct current (DC) and alternating current (AC) concepts and laws; perform calculations to identify basic electrical terms, symbols, units, etc.; to apply the electrical laws (such as, Ohm's law, Kirchhoff's voltage and current laws); to analyze DC/AC electronic circuit, power, etc.; to analyze AC waveform (including single-phase versus three-phase), batteries, chargers, etc. PREREQUISITE: 10624105 Health Physics Calcs & Stats

**NUCLEAR SYSTEMS AND SOURCES...**introduces the learner to the major components of natural/man-made background sources, x-ray tubes and applications, medical-used radioactive materials, accelerators, nuclear gauging devices, non-ionization radiations, and power/research nuclear reactors and associated health physics topics. PREREQUISITE: 10624110 Radioactivity and Regulations.

**ORAL/INTERPERSONAL COMMUNICATION...**provides students with the skills to develop speaking, verbal and nonverbal communication, and listening skills through individual speeches, group activities, and other projects. COREQUISITE: 10838105 Intro Reading and Study Skills or Reading placement assessment equivalent

**RADIATION BIOLOGY...**prepares the learner to convert measuring units and activity to dose rates, predict the effect of radiation on living cells and human organs, evaluate radiation risk, and calculate internal doses. PREREQUISITES: 10624110 Radioactivity and Regulations, 10624105 Health Phys Calc/Stats, 10624114 Nuclear Systems and Sources, 10624122 Rad Physics, 10624123 Rad Phys-Lab, and 10804113 College Tech Math 1A or 10804198 Calculus 1

**RADIATION PHYSICS...**introduces the learner to health physics-related physics, including the properties of radiation; interactions of radiation with matters; basic principles of radiation detection and measurement; and different kinds of radiation detectors; i.e., gas-filled and solid-state detectors. PREREQUISITE: 10624110 Radioactivity and Regulations, 10624105 Health Physics Calc & Stats, and 10804113 College Tech Math 1A or 10804198 Calculus 1

**RADIATION PHYSICS-LAB...**expands the learners ability to perform calculations, select instruments, and analyze radioactive samples. This course is associated with 624-122, Radiation Physics. COREQUISITE: 10624122 Radiation Physics and PREREQUISITE: 10801195 Written Communications and COREQUISITE: Radioactivity and Regulations

**RADIATION SHIELDING...**provides the learner with the skills to calculate radiation attenuation from various geometric radioactive sources, determine the effect of neutron radiation on materials, and estimate the exposure rate from various sources with or without shielding materials. PREREQUISITE: 10624122 Radiation Physics

**RADIATION SHIELD-LAB...**expands the learner's ability to perform shielding of ionizing radiation sources and to measure the penetration of beta and gamma radiation. COREQUISITE: 10624134 Radiation Shielding

**RADIOACTIVE MATERIAL AND MANAGEMENT...**introduces the learner to the proper methods used to dispose of radioactive waste in liquid, solid, gaseous forms; determine waste classification, evaluate methods used to process low-level and high-level waste, determine the package/label requirements, proper type of transport container, shipment quantity classification, storage distance from people and film during shipments by rail/vessel/public roads, proper shipping name and UN number; completion of proper shipping papers; document materials inventory/shipments. PREREQUISITES: 10624105 Health Physics Calc & Statistics, 10624110 Radioactivity and Regulations, 10624114 Nuclear Systems & Sources

**RADIOACTIVITY AND REGULATIONS...**introduces the learner to atomic and nuclear structure; radioactivity and basic dosimetry; regulation standards, including 10CFR 19, 20, etc. COREQUISITE: 10624105 Health Physics Calcs & Stats

**RADIOCHEMISTRY...**provides the student with the fundamentals of chemistry and the application of chemistry control to a nuclear facility. The course will cover basic water treatment principles, corrosion, reactor water chemistry control and chemical hazards. Prepares the learner to separate dissolved, suspended, liquid, and ionic radioactive components; perform qualitative and quantitative analysis of samples; and prevent the production of radioactive material by using proper chemical control. PREREQUISITE: 10624122 Radiation Physics or 10624122OL Radiation Physics

**RADIOLOGICAL EMERGENCIES...**teaches the learner to understand a radiological emergency, which is displaced radioactive substances in solid, liquid, or gaseous forms in amounts resulting in doses to workers, the public, or the environment, that exceeds company, state, and federal limits or regulations; how it is prevented and mitigated, the proper preparation and post-accident actions, as well as the regulations on radioactive releases, estimation of doses in an emergency, and the first response to an emergency. PREREQUISITES: 10624110 Nuclear Technology and Regulations, 10624105 Health Physics Calculations and Statistics and 10624114 Nuclear Systems and Sources

**REACTOR PLANT COMPONENTS...**provides the learner with the fundamentals of heat transfer and fluid flow, and properties of reactor plant materials. The course introduces basic mechanical and electrical components used in nuclear power plants such as different types of piping, valves, pumps, ejectors, filters, turbines, heat exchangers, compressors, lubrication systems, valve actuators, breakers, transformers, relays and other equipment. PREREQUISITES: 10624110 Radioactivity and Regulations, 10624105 Health Physics Calculations & Statistics, 10804113 College Technical Math 1A or 10804198 Calculus 1 and COREQUISITE: 10624114 Nuclear Systems and Sources

**REACTOR THEORY AND OPERATION...**introduces the learner to the basic reactor types, the fission process, reactivity/criticality, reactor kinetics, heat removal, residual/decay heat, basic reactor types, nuclear plant water chemistry, and reactor thermodynamics. PREREQUISITE: 10624122 Radiation Physics and 10624133 Radiological Emergencies

**WRITTEN COMMUNICATION...**teaches the writing process, which includes prewriting, drafting, revising, and editing. Through a variety of writing assignments, the student will analyze audience and purpose, research and organize ideas, and format and design documents based on subject matter and content. Keyboarding skills are required for this course. It also develops critical reading and thinking skills through the analysis of a variety of written documents. PREREQUISITE: 10831103 Intro to College Wrtg or Writing placement assessment equivalent and COREQUISITE: 10838105 Intro to Rdg & Study Skills or Reading placement assessment equivalent