LTC LAKESHORE TECHNICAL COLLEGE

NUCLEAR TECHNOLOGY

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

ABOUT THE PROGRAM
The increasing use of radiation and radioactive materials in today's world has created a demand for radiation protection technicians. The Nuclear Technology program offers the student a unique opportunity to obtain the specialized training in demand by businesses and organizations licensed to utilize radioactive materials. 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.

PROGRAM ADMISSIONS STEPS
- Work with Career Coach to:
  - Submit application and $30 fee.
  - Submit official transcripts (high school and other colleges).

ENROLLMENT PROCESS
- Work with program Academic Advisor to:
  - Complete an assessment for placement (Accuplacer or ACT).
  - Complete Functional Abilities Statement of Understanding form.
  - Meet to plan your first semester schedule, review your entire plan of study, discuss placement assessment results and complete any additional enrollment requirements.

APPROXIMATE COSTS
- $132.20 per credit tuition (WI resident) plus $7.27 per credit student activity fee. $10 per credit online fee. Material fee varies depending on course. Other fees vary by program. Visit gotoltc.edu/financial-aid/tuition-and-fees for details.

FINANCIAL AID
This program is eligible for financial aid. Visit gotoltc.edu/Financial-Aid or talk with your Career Coach about how to apply for aid.

SPECIAL NOTE
- Classes are offered at LTC's main campus with videoconferencing to NWTC's Green Bay Campus and BTC's Milton Campus.
- Students may potentially earn *NUCP certification by maintaining a "B" or above in all coursework. (Program courses meet NUCP standards; certification is contingent upon LTC's NUCP partnership with a nuclear facility) Online students are not eligible. (*NUCP=Nuclear Uniform Curriculum Program)
- 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 with an "OL" suffix. Online courses have prerequisites of other specific online courses and are not interchangeable with the in-person courses. Online classes are constructed without hands-on lab components; therefore, online students work with their industry supervisor to identify suitable activities at their worksite.

CONTACT
LTC Career Coach
920.693.1162 • CareerCoach@gotoltc.edu

Catalog No.	Class Title	Credit(s)
	Term 1	
10624105	Health Physics Calculations and Statistics	3
10624110	Nuclear Technology and Regulations	3
10804115	College Technical Math 1	5
10801195	Written Communication	3
		14
	Term 2	
10624114	Nuclear Systems and Sources	3
10624122	Radiation Physics	3
10624123	Radiation Physics-Lab	2
10624103	Nuclear DC and AC Applications	3
10809122	Introduction to American Government	3
10801196	Oral/Interpersonal Communications	3
		17
	Summer	
10624118	Radiation Biology	3
		3
	Term 3	
10624138	Radioactive Materials Management	2
10624132	Radiological Emergencies	2
10624134	Radiation Shielding	2
10624135	Radiation Shielding Lab	1
10806154	General Physics 1	4
10624149	Reactor Plant Components	4
		15
	Term 4	
10624140	Radiochemistry	3
10624148	Reactor Theory and Operation	3
10624145	Applied Health Physics	3
10624146	Applied Health Physics Lab OR 10624156 Radiation Safety Internship	2
10809198	Introduction to Psychology	3
		14
		TOTAL 63

Most classes in this program have prerequisites.

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 2017-2018 rates and are subject to change prior to the start of the academic year.

The Hire in HIGHER EDUCATION

2017-18

APPLIED HEALTH PHYSICS…prepares learner to issue dosimetry, 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. PREREQ: 10624122 Radiation Physics

APPLIED HEALTH PHYSICS-LAB...expands the 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 App Health Physics

COLLEGE TECHNICAL MATHEMATICS 1...prepares the student to solve linear, quadratic, and rational equations; graphing; formula rearrangement; solve systems of equations; percent; proportions; measurement systems; computational geometry; right and oblique triangle trigonometry; trigonometric functions on the unit circle; and operations on polynomials. Emphasis will be on the application of skills to technical problems. This course is the equivalent of successful completion of College Tech Math 1a and 1b. PRERQUISITES: 10834110 Elementary Algebra w Apps or 31457318 Ind Mtnc Trades Math or 31420320 Machine Tool Math or equivalent.

GENERAL PHYSICS 1...presents the applications and theory of basic physics principles. This course emphasizes problem-solving, laboratory investigation, and applications. Topics include unit conversions and analysis, vectors, translational and rotational kinematics, translational and rotational dynamics, heat and temperature, and harmonic motion and waves. COREQUISITE: 10804197 College Tech Math 1B or 10804114 College Tech Math 1B or 10804114M1 College Tech Math 1B Mod 1 & 10804114M2 College Tech Math 1B Mod 2 or 10804115 College Tech Math 1 or 10624105 Hlth Phys Calc & Stats and 10804118 Interm Algebra

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

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.

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 and measurements to identify basic electrical terms, symbols, units, etc.; 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 HealthPhysics 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 radioactivity materials, accelerators, nuclear gauging devices, non-ionization radiations, and power/research nuclear reactors and associated health physics topics. PREREQUISITE: 10624110 Nuclear Technology & Regulations

NUCLEAR TECHNOLOGY AND REGULATIONS...introduces the learner to atomic and nuclear structure; radioactivity and basic dosimetry; regulation standards, including 10CFR 19, 20, 30, and 35. COREQUISITE: 10624105 Health Physics Calcs & Stats

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 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 Nuclear Tech/Reg, 10624105 Health Phys Calc/Stats, 10624114 Nuclear Systems and Sources, 10624122 Rad Physics, 10624123 Rad Phys-Lab, and 10804115 College Tech Math 1 or 10804114 Tech Math 1B

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 Nuclear Tech & Reg and 10624105 Health Physics Calc & Stats and 10804115 College Tech Math 1 or 10804114 College Tech Math 1B

RADIATION PHYSICS-LAB...expands the learners ability to perform calculations, select instruments, and analyze samples. This course is associated with 624-122, Radiation Physics. COREQUISITE: 10624122 Radiation Physics and PREREQUISITE: 10801195 Written Communications and COREQUISITE: 10624110 Nuclear Technology & 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 Nuclear Technology & Regulations, 10624114 Nuclear Systems & Sources

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

RADIOLOGICAL EMERGENCIES...prepares the learner to understand a radiological emergency within the commercial nuclear power industry and explain how it is prevented, mitigated, and the proper preparations should an emergency occur. A radiological emergency is displaced radioactive substances in solid, liquid, or gaseous form in amounts which may result in doses to plant workers, plant equipment, the environment, or the public, that exceed company, state, and federal limits or regulations. Post-accident actions will be described as well as company, state, and federal regulations on radioactive releases and doses. 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 Nuclear Technology & Regulations, 10624105 Health Physics Calculations & Statistics, 10804115 College Technical Math 1 or 10804114 College Tech Math 1B 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 10624132 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 equivalent and COREQUISITE: 10838105 Intro Rdg & Study Skills or equivalent