NUCLEAR RADIATION SAFETY/HEALTH PHYSICS ITS

Program Number 10-825-1
Associate Degree in Applied Science • Varies

ABOUT NUCLEAR RADIATION SAFETY/HEALTH PHYSICS

The increasing use of radiation and radioactive materials in today's world has created a demand for nuclear technicians. The Nuclear Radiation Safety/Health Physics ITS program offers individuals who are employed in the industry 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.
- 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

After you are admitted to your program you will meet with your Advisor to plan your first semester schedule, review your entire plan of study, discuss placement assessment results and complete any additional enrollment requirements. Enrollment requirements for this program's courses include:

- Complete an assessment for placement (Accuplacer or ACT).
- Complete Functional Abilities Statement of Understanding form.
- Meet with your program's advisor.

APPROXIMATE COSTS

- $140 per credit (resident)
- Other fees vary by program (books, supplies, materials, tools, uniforms, health related exams, etc.) 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

This Individualized Technical Studies program is designed for working adults in the Nuclear/Radiation/Health Physics industry.This online program allows participants to access both archived and live synchronous lectures in the 10624xxx courses. Most classes in this program have prerequisites. This program is constructed without lab components. Therefore, students should work with their industry supervisor to identify suitable activities at their worksite.

CONTACT

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Catalog No.	Class Title	Credit(s)
	Term 1	
10624105OL	Health Physics Calculations and Statistics (OL)	3
10624110OL	Nuclear Technology and Regulations (OL)	3
10540100	Fundamentals of Emergency Mgmt (OL)	3
10540102	Intro to Hazards (OL)	3
		12
	Term 2	
10624114OL	Nuclear Systems and Sources (OL)	3
10624122OL	Radiation Physics (OL)	3
		6
	Summer	
10624118OL	Radiation Biology (OL)	3
		3
	Term 3	
10624149OL	Reactor Plant Components (OL)	4
10624138OL	Radioactive Materials Management (OL)	2
10624132OL	Radiological Emergencies (OL)	2
10624134OL	Radiation Shielding (OL)	2
		10
	Term 4	
10624140OL	Radiochemistry (OL)	2
10624148OL	Reactor Theory and Operation (OL)	3
10624145OL	Applied Health Physics (OL)	3
		8
	Occupational Credits	**39**
10801195	Written Communication (OL, IP, TR, AS) OR 10801197 Technical Reporting (OL, IP, TR, AS) OR 10801136 English Composition 1 (OL, IP, TR, AS)	3
10801196	Oral/Interpersonal Communications (OL, IP, TR, AS)	3
10804118	Intermediate Algebra (OL, IP, TR, AS)	4
10806134	General Chemistry (IP, TR, AS)	4
10809195	Economics (OL, IP, TR, AS)	3
10809196	Sociology-Intro to (OL, IP, TR, AS)	3
10809198	Psychology-Introduction to (OL, IP, TR, AS)	3
	General Education Credits	**23**
	TOTAL	**62**

(OL)=Online
(IP)=In Person
(TR)=Transfer Credits from Another College
(AS)=Advanced Standing

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.

APPLIED HEALTH PHYSICS (OL)...prepares the learner to issue dosimetry, monitor personal exposure, calculate radioactive airborne activity concentration, estimate radioactive airborne 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. Online classes are not certified by NUCP. PREREQUISITE: 10624122OL Radiation Physics and CONDITION: 196243 Rad Safety Interm or 108251 ITS Program Admission Requirements met.

ECONOMICS (OL, IP, TR, AS)...provides the participant with an overview of how a market-oriented economic system operates, and it surveys the factors which influence national economic policy. Basic concepts and analyses are illustrated by reference to a variety of contemporary problems and public policy issues. Concepts include scarcity, resources, alternative economic systems. growth, supply and demand, monetary and fiscal policy, inflation, unemployment and global economic issues. COREQUISITE: 10838105 Intro Reading and Study Skills or equivalent

FUNDAMENTALS OF EMERGENCY MGMT (OL)...prepares the learner to describe emergency management functions at the local, state, and national levels; support system for the emergency management position; key characteristics of the professional emergency; requirements of the emergency manager during the four phases of an emergency; familiarity with the function of an emergency operations center; resource requirements and developing a system to maintain resources; and the importance of training, exercising, and fostering opportunities.

GENERAL CHEMISTRY (IP, TR, AS)...covers the fundamentals of chemistry. Topics include the metric system, problem-solving, periodic relationships, chemical reactions, chemical equilibrium, properties of water; acids, bases, and salts; and gas laws. PREREQUISITE: 10834110 Elem Algebraor equivalent and COREQUISITE: 10838105 Intro Rdg & Study Skills or equivalent

HEALTH PHYSICS CALCULATIONS AND STATISTICS (OL)...prepares the learner to solve linear and exponential equations, logarithms, plot graphs, determine counting statistics and reliability, and work with geometry and trigonometry problems. Online classes are not certified by NUCP. CONDITION: 196242 Radiation Safety Basic Certificate or 108251 ITS Program admission requirements met or Nuclear Tech Dominion Grant

INTERMEDIATE ALGEBRA (OL, IP, TR, AS)...offers the learner algebra content with applications. Topics include properties of real numbers, order of operations, algebraic solution for linear equations and inequalities, operations with polynomial and rational expressions, operations with rational exponents and radicals, algebra of inverse, logarithmic and exponential functions. PRERQUISITES: 10834110 Elementary Algebra w Apps or equivalent

INTRO TO HAZARDS (OL)...prepares the learner to apply basic terms used to discuss hazardous materials; how hazardous materials affect people and the environment; roles of Federal, State, and local agencies; provisions of legislation; hazardous materials identification systems; intentional use of toxic industrial chemicals (TICs) as Weapons of Mass Destruction (WMD); locations in which TICs are commonly found; assess what communities can do to increase preparedness; and steps individuals take to protect themselves.

NUCLEAR SYSTEMS AND SOURCES (OL)...introduces the learner to the major components of accelerators, non-ionization radiation, isotope generators, nuclear gauging devices, X-ray tubes, nuclear reactors, and natural/background sources and the radiation hazards associated with them. Online classes are not certified by NUCP. CONDITION: 196242 Radiation Safety Basic Certificate or 108251 ITS Program admission requirements met or Nuclear Tech Dominion Grant; PREREQUISITE: 10624110OL Nuclear Technology and Regulations

NUCLEAR TECHNOLOGY AND REGULATIONS (OL)...introduces the learner to atomic and nuclear structure; radioactivity and basic dosimetry; regulation standards including 10 CFR 19, 20, 30 and 35. Online classes are not certified by NUCP. CONDITION: 196242 Radiation Safety Basic Certificate or 108251 ITS Program admission requirements met or Nuclear Tech Dominion Grant

ORAL/INTERPERSONAL COMMUNICATIONS (OL, IP, TR, AS)...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

PSYCHOLOGY-INTRO (OL, IP, TR, AS)...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. COREQUISITE: 10838105 Intro Reading and Study Skills or equivalent

RADIATION BIOLOGY (OL)...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. Online classes are not certified by NUCP. CONDITION: 196243 Radiation Safety Intermediate Admission OR 108251 ITS Program Admission. PREREQUISITES: 10624110OL Nuclear Tech & Regs, 10624105OL Hlth Phys Calc & Stats, 10624114OL Nuclear Systt & Sources, 10624122OL Radiation Physics, 10804118 Interm Algebra w Applications or 10804113 College Tech Math 1A , 10803114 College Tech Math 1B

RADIATION PHYSICS (OL)...introduces the learner to health physics-related physics, properties of radiation, interactions of radiation with matters, detection and measuring radiation, and gas-filled and solid-state detectors. Online classes are not certified by NUCP. PREREQUISITES: 10624110OL Nuclear Technology and Regulations, 10624105OL Health Physics Calculations and Statistics, 10804118 Intermediate Algebra w Applications and CONDITION: 196243 Rad Safety Interm or 108251 ITS Program Admission Requirements met

RADIATION SHIELDING (OL)...provides the learner with the skills to calculate radiation attenuation from various geometric radioactive sources, and estimate the exposure rate from various sources. Online classes are not certified by NUCP. PREREQUISITE: 10624122OL Radiation Physics and CONDITION: 196243 Rad Safety Interm or 108251 ITS Program Admission Requirements met

RADIOACTIVE MATERIALS MANAGEMENT (OL)...introduces the learner to the proper methods used to dispose of radioactive waste in liquid, solid, gaseous forms; determine waste classification, 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; evaluate methods used to process low level and high level waste. Online classes are not certified by NUCP. CONDITION: 196243 Radiation Safety Intermediate Admission OR 108251 ITS Program Admission. PREREQUISITES: 10624105OL Health Physics Calculations and Statistics, 10624110OL Nuclear Technology and Regulations, 10624114OL Nuclear Systems and Sources

RADIOCHEMISTRY (OL)...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. Online classes are not certified by NUCP. PREREQUISITES: 10624122OL Radiation Physics and 10806134 General Chemistry or 10806174 General Chemistry or High School Chemistry equivalent, and CONDITION: 196244 Radiation Safety Advanced Certificate or 108251 ITS Program admission requirements met

RADIOLOGICAL EMERGENCIES (OL)...prepares the learner to plan and assist in emergencies involving radioactive material and radiation by calculating projected doses, collecting environmental samples, following emergency plans, and managing affected personnel. Online classes are not certified by NUCP. PREREQUISITES: 10624114OL Nuclear Systems and Sources, 10624105OL Hlth Physics Calc and Statistics, 10624110OL Nuclear Tech and Regulations, and CONDITION: 196244 Radiation Safety Advanced Certificate or 108251 ITS Program admissions requirements met

REACTOR PLANT COMPONENTS (OL)...introduces basic mechanical and electrical components used by 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. CONDITION: 108251 ITS Program Admission. PREREQUISITES: 10624110OL Nuclear Tech and Regs and 10624105OL Health Phys Calc & Stats and 10804118 Interm Algebra w Appl or 10804113 College Tech Math 1A and 10804114 College Tech Math 1B and COREQUISITE: 10624114OL Nuclear Systems and Sources

REACTOR THEORY AND OPERATION (OL)...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. CONDITION: 108251 ITS Program Admission. PREREQUISITE: 10624122OL Radiation Physics and 10624132 Radiological Emergencies

SOCIOLOGY-INTRO (OL, IP, TR, AS)...introduces students to the basic concepts of sociology: culture, socialization, social stratification, multi-culturalism, and the five institutions, including family, government, economics, religion, and education. Other topics include demography, deviance, technology, environment, social issues, social change, social organization, and workplace issues. COREQUISITE: 10838105 Intro Reading and Study Skills or equivalent

WRITTEN COMMUNICATION (OL, IP, TR, AS)...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

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The Chief Human Resources Officer has been designated to handle inquiries regarding the College's nondiscrimination policies.