A.A.S. Energy Systems Nuclear Operations Technology, Licensed Operator Concentration

(2.5 Years)

Program Objectives:

1. Apply a fundamental knowledge of mathematics, sciences (e.g. - physics, chemistry, and thermodynamics), and an understanding of the nuclear process while working in the nuclear industry.
2. Demonstrate critical thinking and analytical problem solving skills, with special emphasis on workplace, environmental, and safety concerns, to solve professional and technical challenges in the nuclear industry.
3. Exhibit an understanding and adherence to the professional, social and ethical standards of the nuclear industry.
4. Practice a commitment to be professionally and technically current with changing technologies in the nuclear industry through self-improvement and lifelong learning.
5. Demonstrate communication and teamwork skills in diverse and multidisciplinary teams, while striving for increasing responsibilities and positions of leadership in the nuclear industry.

Student Outcomes:

1. Apply knowledge of mathematics and natural sciences (physics, chemistry, thermodynamics and electrical sciences) to solve related problems.
2. Demonstrate a knowledge of nuclear physics, reactor protection, design, materials and radiation protection to analyze and solve nuclear industry problems.
3. Demonstrate a knowledge of nuclear plant system operations, plant components and an ability to interpret drawings during operational troubleshooting, and maintenance evolutions.
4. Integrate and apply knowledge of nuclear technical material, safety procedures and operations to analyze abnormal, emergency and nuclear accident scenarios.
5. Demonstrate an understanding of the principles of Conduct of Operations.
6. Demonstrate effective written and oral communication in individual and group environments.
7. Demonstrate the ability to collect, analyze, and interpret data; report findings including observations and appropriate recommendations.
8. Demonstrate an understanding of the Federal, State and Local regulations, standards and rules applying to the nuclear industry, as well as safe work practices.
9. Demonstrate an understanding of ethical responsibilities required in the nuclear industry.

10. Demonstrate the ability to provide leadership and function as a member of a team.

Students must register concurrently for the lab course associated with each theory course.

Program Admissions Requirements

Placement Test	Math
ACT	19
SAT	500
ALEKS	30

Code	Title	Credits
Program entry requires the successful completion of the following prerequisite courses, or equivalents:		
Objective 1 - ENGL 1101 or ENGL 1102		3
Objective 2		3
ESET 1100	Engineering Technology Orientation	1
ESET 1100L	Introduction to an Industrial Environment Laboratory	1
ESET 1140	Applied Technical Intermediate Algebra	5
or MATH 1147	Precalculus	
ESET 1152	Nuclear Careers and Information	1
ESET 1153	Radiological Control Fundamentals	3
Total Credits		**17**

General Education

The listing below includes program requirements that also fulfill General Education requirements.

Code	Title	Credits
Objective 1 - ENGL 1101 and ENGL 1102 [1]		6
Objective 2		3
Objective 3 - MATH 1143, MATH 1147, MATH 1153, MATH 1160, MATH 1170, or MGT 2216 [1]		3-5
Objective 4- TGE 1257		3
Objective 5 - PHYS 1101 & PHYS 1101L and CHEM 1101 or CHEM 1111 & CHEM 1111L		7-9
Objective 6		3
Total Credits		**25-29**

[1] “P” courses are equivalent to the original course.

Major Requirements

Code	Title	Credits
ESET 1121	Basic Electricity and Electronics	4
ESET 1121L	Basic Electricity and Electronics Laboratory	3
ESET 1122	Electrical Systems and Motor Control Theory	3
ESET 1122L	Electrical Systems and Motor Control Theory Laboratory	1
ESET 1130	Initial Operator Training and Student Operations	4

ESET 1152	Nuclear Careers and Information	1
ESET 2220	Thermal Cycles and Heat Transfer	2
ESET 2221	Nuclear Steam Supply Systems	2
ESET 2239	Pumps, Valves, and Fluid Flow	5
ESET 2239L	Pumps, Valves, and Fluid Flow Laboratory	4
ESET 2242	Practical Process Measurements and Control	2
ESET 2248	Power Plant Documentation and Procedures	2
ESET 2249	Reactor Plant Materials	3
ESET 2260	Nuclear Instrumentation	2
ESET 2251	Reactor Theory Safety and Design	4
ESET 2279	Conduct of Operations	4
ESET 2280	Capstone and Case Studies in Nuclear Engineering Technology	2
General Education Objective 1: Must complete both		**6**
ENGL 1101	Writing and Rhetoric I	
ENGL 1102	Writing and Rhetoric II	
General Education Objective 3: Complete one of the following		**3-5**
MATH 1143	Precalculus I: Algebra	
MATH 1147	Precalculus	
MATH 1153	Statistical Reasoning	
MATH 1160	Survey of Calculus	
MATH 1170	Calculus I	
MGT 2216	Business Statistics	
General Education Objective 4:		
TGE 1257	Applied Ethics in Technology	3
General Education Objective 5: Complete the following		**7-9**
CHEM 1101	Introduction to Chemistry	
or CHEM 1111 & 1111L	General Chemistry I and General Chemistry I Lab	
PHYS 1101 & 1101L	Elements of Physics and Elements of Physics Laboratory	
Total Credits		**67-71**

Degree Totals

Code	Title	Credits
Program Admission Requirements (General Education Credits not included)		11
General Education		25-29
Major Requirements (General Education Credits not included)		48
Free Electives		0
Total Credits		**84-88**

ISU Degree Requirements (http://coursecat.isu.edu/undergraduate/degreerequirements/)

ISU General Education for College of Technology (http://coursecat.isu.edu/undergraduate/technology/#text)

Major Academic Plan (MAP) (https://www.isu.edu/advising/maps/)