A.A.S. Energy Systems Nuclear Operations Technology, Nuclear Facility Technician 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.

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 | 6
Objective 2 | 3
Objective 3 - MATH 1143, MATH 1147, MATH 1153, MATH 1160, MATH 1170 or MGT 2216 | 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

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
### ISU Degree Requirements

#### ISU General Education for College of Technology

[http://coursecat.isu.edu/undergraduate/technology/#text](http://coursecat.isu.edu/undergraduate/technology/#text)

#### Major Academic Plan (MAP)

[https://www.isu.edu/advising/maps/](https://www.isu.edu/advising/maps/)

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**ESET 1151** Nuclear Industry Fundamental Concepts 3

**ESET 1151L** Nuclear Industry Fundamental Concepts Lab 1

**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 2250** Radiation Detection and Protection 2

**ESET 2261** Glovebox and Manipulator Operations Lab 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

**Choose one of the following Objective 3 courses:** 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** or **CHEM 1111 & 1111L** Introduction to Chemistry and 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

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<th>Code</th>
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<td>Program Admission Requirements (Required General Education credits removed)</td>
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ISU Degree Requirements [http://coursecat.isu.edu/undergraduate/degreerequirements/](http://coursecat.isu.edu/undergraduate/degreerequirements/)