



Model Curriculum

NOS Name: Industrial Safety for Semiconductor Manufacturing - Electrical

NOS Code: ELE/N1005

NOS Version: 1.0

NSQF Level: 5

Model Curriculum Version: 1.0

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Training Parameters

Sector	Electronics
Sub-Sector	Semiconductor & Components
Occupation	Safety
Country	India
NSQF Level	5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3119.1100
Minimum Educational Qualification and Experience	<p>Completed 3 year diploma after 10th (Electronics/Electrical/Mechanical) with 1 Year of experience relevant experience</p> <p>OR</p> <p>Completed 2nd year of UG (UG Diploma) ((B.Sc/B.E./B.Tech) in the relevant field – Electrical / Electronics, Mechanical) with 1 Year of experience relevant Experience</p> <p>OR</p> <p>12th grade Pass with 2 Years of experience relevant experience</p> <p>OR</p> <p>10th grade pass with 4 Years of experience</p>
Pre-Requisite License or Training	NA
Minimum Job Entry Age	21
Last Reviewed On	31/01/2024
Next Review Date	31/01/2027
NSQC Approval Date	31/01/2024
NOS Version	1.0
Model Curriculum Creation Date	
Model Curriculum Valid Up to Date	



Model Curriculum Version	1.0
Maximum Duration of the Course	60

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes:

At the end of the program, the learner should have acquired the listed knowledge and skills:

Compulsory:

- Basic lecture introduces different aspects of Electronics and exposure to the current activities at a particular.
- Provides exposure to the infrastructure available at the Semiconductor in the form of series of lectures and application notes. This would provide in-depth information about the Electrical safety, equipment and their capabilities.
- The lecture series is organized as modules, such as Industrial Safety/Health and personnel Protective equipment etc.

Compulsory Modules:

The table lists the modules and their duration corresponding to the Compulsory NOS of the QF.

NOS and Module Details	Theory / Demonstration Duration (In Hours)	Practical/OJT Duration (In Hours)	On-the-Job Training Duration (in hours) (Mandatory)	On-the-Job Training Duration (in hours) (Recommended)	Total Duration (In Hours)
<i>Module 1</i> (Introduction to the Basics of semiconductor)	20:00	00:00	00:00	00:00	20:00
ELE/NXXXX	20:00	00:00	00:00	00:00	20:00
<i>Module 2</i> (Industrial Safety for Electrical)	10:00	30:00	00:00	00:00	40:00
ELE/NXXXX	10:00	30:00	00:00	00:00	40:00
Total Duration	30:00	30:00	00:00	00:00	60:00

Module Details

Module 1: Introduction to the Basics of semiconductor

Terminal Outcomes:

- Explain the basic concepts of Electronics
- Explain the basic concepts of Semiconductor Physics

<i>Duration: 20:00 hrs</i>
Theory - Key Learning Outcomes
<ul style="list-style-type: none"> • Basic concepts of Electronics • Basics of Semiconductor Physics
Tools, Equipment and Other Requirements
Labs equipped with the following: <ul style="list-style-type: none"> • PCs/Laptops • Notepad and pens • Internet with Wi-Fi (Min 2 Mbps dedicated)

Module 2: Industrial Safety for Semiconductor manufacturing- Electrical

Terminal Outcomes:

- Learning about the Electrical Safety
- Various Personnel Protective Equipment

<i>Duration: 10:00 hrs</i>
Theory - Key Learning Outcomes
<ul style="list-style-type: none"> • Describe electric safety risks for human • List Electric safety hazards in a fab/ manufacturing industry • List electric safety hazards including arc flash risks/ Identify and read warning signs and labels • Demonstrate capacity to identify electric hazards in a manufacturing facility/ workplace

<ul style="list-style-type: none"> • List potential sources of latent (electric) energy in a site • Draw Arc flash boundaries, Select appropriate PPE as per specifications • List PPE for safe performance of different electric facility procedures
<p><i>Duration: 30:00 hrs</i></p>
<p>Practical - Key Learning Outcomes</p>
<ul style="list-style-type: none"> • Demonstrate PPE selection, testing, correct use, disposal • Describe and perform Lockout/Tagout procedures for Manufacturing Systems • Describe/demonstrate testing for leakage current, latent energy sources, de-energization • Locate all emergency machine off buttons and describe how to EMO Manufacturing Systems • Safely perform tasks (including LOTO) while working on and around Manufacturing Systems • Describe Emergency Guidelines and Procedures • Demonstrate how to handle emergencies: <ul style="list-style-type: none"> • electric fires; disengaging an electrocuted person • Explain grounding; GFCI; electric safety standards • Create a properly grounded, well earthed system • Test and verify earthing as per standards
<p>Classroom Aids: (If Offline mode)</p>
<ul style="list-style-type: none"> • Whiteboard and Markers • Chart paper and sketch pens • LCD Projector and Laptop for presentations
<p>Tools, Equipment and Other Requirements</p>
<p>Labs equipped with the following:</p> <ul style="list-style-type: none"> • PPE • Basic Electrical Safety kit • Electrical LOTO Kit

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Post Graduate Science & Engineering	Electrical/ Physics	2	Semiconductor Technology	1	Semiconductor Technology	

Trainer Certification	
Domain Certification	Platform Certification
<p>“Industrial Safety for Semiconductor Manufacturing - Electrical, ELE/N1005, version 1.0”. Minimum accepted score is 80%.</p>	<p>Recommended that the Trainer is certified for the Industrial Safety for Semiconductor Manufacturing - Electrical “Trainer (VET and Skills)”, mapped to the Qualification Pack: “MEP/Q2601, V2.0”, with minimum score of 80%</p>

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
Post Graduate Science & Engineering	Electrical/ Physics	3	Semiconductor Technology	2	Semiconductor Technology	

Assessor Certification	
Domain Certification	Platform Certification
<p>“Industrial Safety for Semiconductor Manufacturing - Electrical, ELE/N1005, version 1.0”. Minimum accepted score is 80%.</p>	<p>Recommended that the Assessor is certified for the Industrial Safety for Semiconductor Manufacturing - Electrical “Assessor (VET and Skills)”, mapped to the Qualification Pack: “MEP/Q2701, V2.0”, with minimum score of 80%</p>

4. Types of evidence or evidence-gathering protocol:

- Time-stamped & geotagged reporting of the assessor from assessment location
- Centre photographs with signboards and scheme specific branding
- Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
- Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

5. Method of verification or validation:

- Surprise visit to the assessment location
- Random audit of the batch
- Random audit of any candidate

6. Method for assessment documentation, archiving, and access

- Hard copies of the documents are stored
- Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
- Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

Glossary

Term	Description
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical/OJT application).
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module . A set of terminal outcomes help to achieve the training outcome.
National Occupational Standard	National Occupational Standard specify the standard of performance an individual must achieve when carrying out a function in the workplace
Persons with Disability	Persons with Disability are those who have long-term physical, mental, intellectual, or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others

Acronyms and Abbreviations

Term	Description
QF	Qualification File
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
SSC	Skill Sectors Councils

NASSCOM	National Association of Software & Service Companies
NCO	National Classification of Occupations
ISO	International Organization for Standardization
SLA	Service Level Agreement
IT	Information Technology
CRM	Customer Relationship Management
PC	Performance Criteria
PwD	Persons with Disability
SOP	Standard Operating Procedure