EFSP Auxiliary ESL Curriculum

Semiconductor English Jargon Quick Reference

Field-specific terms, contrast pairs, and high-pressure sentence frames

Audience: semiconductor process engineers, yield engineers, product engineers, equipment engineers, fab supervisors, quality teams, test and packaging teams, foundry coordinators, supply planners, applications engineers, and technical program managers

Focus: A semiconductor English curriculum for wafer fabrication, lithography, process integration, deposition and etch, metrology, yield learning, cleanroom discipline, equipment uptime, packaging, reliability qualification, foundry communication, and customer pressure.

Designed for advanced ESL learners who already use professional English and need industry-specific terminology, realistic meetings, role-play pressure, careful pushback, and polished workplace outputs.

Teaching stance: this is language and workplace-communication training, not legal, medical, financial, safety, or regulatory advice. Instructors should connect every scenario to the learner's current company policies, local rules, and approved procedures.

Nomenclature and Jargon

These are classroom working definitions. Learners should adapt wording to their organization's policies, systems, and local regulatory environment.

Wafer Fabrication Flow and Process Integration

Term	Working meaning
wafer	Thin semiconductor substrate, usually silicon, on which integrated circuits are fabricated.
fab	Semiconductor fabrication facility where wafers are processed through manufacturing steps.
process flow	Ordered sequence of semiconductor manufacturing steps, layers, inspections, holds, and decision points.
node	Technology generation or process family, often associated with feature size, performance, density, and design rules.

Lithography, Reticles, and Critical Dimensions

Term	Working meaning
lithography	Patterning process that transfers circuit features to a wafer using light, masks, and photoresist.
photoresist	Light-sensitive material used in lithography to define patterns on a wafer.
reticle	Photomask used in lithography to project circuit patterns onto a wafer.
critical dimension	A measured feature size on a wafer that must stay within specification for device performance and yield.

Deposition, Etch, CMP, and Process Windows

Term	Working meaning
deposition	Process of adding material layers to a wafer by physical, chemical, epitaxial, or atomic-layer methods.
etch	Process that removes selected material from a wafer using wet chemistry or plasma-based methods.
CMP	Chemical mechanical planarization; a process that smooths wafer surfaces for later manufacturing steps.
process window	Range of process conditions under which results meet specification with acceptable margin.

Metrology, SPC, and Yield Learning

Term	Working meaning
metrology	Measurement discipline used to verify process, dimension, film, defect, and device characteristics.
SPC	Statistical process control; use of control charts and limits to monitor process stability.
yield	Share of wafers, die, units, or lots that meet requirements after manufacturing, test, or qualification.
excursion	Manufacturing event or trend outside expected control limits, specifications, or normal process behavior.

Defect Density and Cleanroom Contamination

Term	Working meaning
defect density	Number or rate of defects on a wafer, die, layer, lot, or process area.
particle	Small contaminant that can create defects, yield loss, reliability risk, or process instability.

Term	Working meaning
cleanroom	Controlled manufacturing environment designed to limit particles, humidity, electrostatic risk, and contamination.
contamination control	Practices used to prevent particles, residues, metals, organics, moisture, or handling errors from affecting wafers or devices.

Equipment Uptime, Recipes, and Tool Matching

Term	Working meaning
tool uptime	Percentage of time equipment is available and qualified for production use.
preventive maintenance	Planned equipment service performed to reduce unplanned downtime, drift, contamination, safety risk, or tool instability.
recipe	Controlled equipment parameters used to run a process step on a wafer, lot, or tool.
tool matching	Effort to make similar manufacturing tools produce equivalent results within defined limits.

Packaging, Test, and Reliability Qualification

Term	Working meaning
package	Protective and electrical interface that connects a semiconductor die to a board or system.
binning	Sorting tested semiconductor units into performance, power, speed, or quality categories.
burn-in	Stress testing used to screen for early-life failures before product release or shipment.
qualification	Evidence-based approval that a process, product, tool, package, supplier, or change meets defined requirements.

Foundry, Tape-Out, PDK, and Capacity Communication

Term	Working meaning
foundry	Semiconductor manufacturer that fabricates chips for external customers or design companies.
tape-out	Final release of a chip design to the foundry for mask generation and fabrication.
PDK	Process design kit; foundry-provided design rules, models, and files used to design chips for a process.
capacity allocation	Decision process for assigning limited foundry, tool, test, or assembly capacity across products or customers.

Industry-Specific Meeting Moves

Situation	Useful language
Wafer Fabrication Flow and Process Integration	Before we commit, I want to confirm wafer, fab, the owner, and the evidence behind the decision. If process flow, route control, layer dependency, and integration risk must be confirmed before movement., I recommend we document the risk and agree on the next step.
Lithography, Reticles, and Critical Dimensions	Before we commit, I want to confirm lithography, photoresist, the owner, and the evidence behind the decision. If reticle status, photoresist behavior, exposure conditions, metrology repeatability, and control limits need review., I recommend we document the risk and agree on the next step.
Deposition, Etch, CMP, and Process Windows	Before we commit, I want to confirm deposition, etch, the owner, and the evidence behind the decision. If deposition uniformity, etch selectivity, cmp margin, and the qualified process window must be protected., I recommend we document the risk and agree on the next step.

Situation	Useful language
Metrology, SPC, and Yield Learning	Before we commit, I want to confirm metrology, SPC, the owner, and the evidence behind the decision. If spc trends, sampling change, tool history, defect signatures, and product mix must be separated., I recommend we document the risk and agree on the next step.
Defect Density and Cleanroom Contamination	Before we commit, I want to confirm defect density, particle, the owner, and the evidence behind the decision. If defect density, cleanroom protocol, contamination source, containment, and affected-lot traceability require action., I recommend we document the risk and agree on the next step.
Equipment Uptime, Recipes, and Tool Matching	Before we commit, I want to confirm tool uptime, preventive maintenance, the owner, and the evidence behind the decision. If tool uptime, preventive maintenance status, recipe qualification, tool matching evidence, and bottleneck risk must be balanced., I recommend we document the risk and agree on the next step.
Packaging, Test, and Reliability Qualification	Before we commit, I want to confirm package, binning, the owner, and the evidence behind the decision. If package interaction, binning criteria, burn-in results, qualification status, and customer-use conditions are not interchangeable., I recommend we document the risk and agree on the next step.
Foundry, Tape-Out, PDK, and Capacity Communication	Before we commit, I want to confirm foundry, tape-out, the owner, and the evidence behind the decision. If foundry allocation, pdk readiness, mask schedule, change freeze, and capacity allocation need documented assumptions., I recommend we document the risk and agree on the next step.

High-pressure pushback frames

- I understand the urgency. The risk is that we move faster than the evidence or process supports.
- I am not blocking the goal. I am naming the condition we need before the decision is safe and credible.
- If we accept this risk, we should name the owner, document the assumption, and define the trigger for escalation.
- That may be possible, but not under the current scope, timeline, or approval path.
- Let's separate what we know, what we assume, and what still needs confirmation.

Contrast Pairs

Do not confuse	Useful distinction
wafer vs node	In wafer fabrication flow and process integration, define whether the discussion is about the current fact pattern, the controlling process, the stakeholder pressure, or the final decision.
lithography vs critical dimension	In lithography, reticles, and critical dimensions, define whether the discussion is about the current fact pattern, the controlling process, the stakeholder pressure, or the final decision.
deposition vs process window	In deposition, etch, cmp, and process windows, define whether the discussion is about the current fact pattern, the controlling process, the stakeholder pressure, or the final decision.
metrology vs excursion	In metrology, spc, and yield learning, define whether the discussion is about the current fact pattern, the controlling process, the stakeholder pressure, or the final decision.
defect density vs contamination control	In defect density and cleanroom contamination, define whether the discussion is about the current fact pattern, the controlling process, the stakeholder pressure, or the final decision.
tool uptime vs tool matching	In equipment uptime, recipes, and tool matching, define whether the discussion is about the current fact pattern, the controlling process, the stakeholder pressure, or the final decision.
package vs qualification	In packaging, test, and reliability qualification, define whether the discussion is about the current fact pattern, the controlling process, the stakeholder pressure, or the final decision.
foundry vs capacity allocation	In foundry, tape-out, pdk, and capacity communication, define whether the discussion is about the current fact pattern, the controlling process, the stakeholder pressure, or the final decision.