



Googleplex Technologies LLC

**43 Broad Street, A300
Hudson, MA 01749**

H3 Training program

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H3 training program

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52 week H3 training program

Brief Overview

Googleplex Technologies is a specialty service company supporting electronics manufacturing throughout the world. Googleplex Technologies provides a diverse array of custom services to streamline electronics manufacturing through extensive specialized technical abilities and equipment that are not readily available to electronics manufacturers and assemblers. This training program is aimed at creating a specialist that melds all necessary disciplines (mechanical and electrical engineering, programming and electrical assembly) required to be a master technician for the industry.



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Weeks 1 & 2 – Orientation

The aim of this orientation period is to introduce the trainee to Googleplex Technologies LLC's (hereafter referred to as GTL) business processes and capabilities. During this period, the trainees are expected to become functionally familiar with GTL's production and service capacities as well as the production flow of accepted projects. Further the trainee will be introduced to all varied production flows and procedures followed.

The trainee will also be expected to assimilate all formal company directives with regards to work scheduling, load balancing, operating hours and company operating philosophy.

During this time, the trainee will also be exposed to basic familiarization with all of the machines, tools and supplies used by GTL to execute the custom services offered. Each Training module has a practical application component incidental to the training.

Weeks 3 to 12 – Device Programming Services

Device Programming is the core service provided by GTL. Trainee must become familiar with all aspects of programming integrated circuits and the machinery and fixtures involved. This section of training is broken into 2 parts: Devices and Processes. In the first part, the trainee will be exposed to all programmable devices from the simplest to the most complex. In the second part, the trainee will learn all of the possible ways in which a device may be programmed.

Itinerary:

Part one: Devices (weeks 3-6)

During this period, trainee is expected to cover and become familiar with the entire gamut of programmable integrated circuits from the 1980's to the present. They must also learn the handling and procedural differences for OTP (One Time Programmable) versus the many types of erasable and/or re-programmable devices. The training will include exposure and familiarity with the following programmable integrated circuits:

- Simple logic (early logic chips)
- PAL's (Programmable Array Logic)
- GAL's (Gate Array Logic)
- FPGA (Field Programmable Gate Array) logic
- Anti-fuse logic (QuickLogic & Actel)
- Cluster logic devices
- Parallel logic devices
- PROM (Programmable Read Only Memory)
- EPROM (Erasable Programmable Read Only Memory)
- EEPROM (Electronic Erasable Programmable Read Only Memory)

- NOR Flash Memory
- NAND Flash Memory
- eMMC (embedded Multi-Media Card) memory
- Managed NAND flash memory
- Configuration PROMS
- SPI (Serial Peripheral Interface) Flash
- I2C configuration devices
- Programmable memory managers
- Programmable clocks and timing devices
- PSOC (Programmable System On a Chip) devices
- Miscellaneous devices with programmable areas

Part Two: Processes (Weeks 7-12)

During this portion of the training, the candidate will be exposed to all equipment and processes used to physically program devices. The training is divided equally between primary and auxiliary programmers. All devices need at least two platforms to cross check and verify accuracy of operation of the programming equipment.

Primary systems:

- AP900
- T9800
- T8000
- SuperPro 6100
- SuperPro 6100N
- SuperPro 7500
- BPM-2600
- Silicon Sculptor III



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- 48Pro2C

Auxiliary Systems

- Promate III
- Lattice Model 300
- TI Gang Pro
- AVR 6000
- Cyclocks programmer
- Silicon Labs field programmer
- LTC programmer
- PSOC programmer

Weeks 13 to 18 – Tape and reel services

Tape and reel services is the second core service provided by GTL. More devices are processed through tape and reel than any other service offered by GTL. It is due to the lower revenue generated by this service that it is considered subordinate in importance to device programming. Tape and reel is the process of preparing IC's for automated insertion in electronics manufacture; it is both less complex and much more highly repetitive than device programming. There are intricacies and details that must be mastered during this portion of training.

Itinerary:

During this period, trainee will be exposed to theory and application of tape and reel prep. The following topics will be covered:

- Tape and reel equipment
- Tape and reel supplies
- Heat vs PSA applications
- Jedec standard EIA-481
- Exceptions to EIA-481 among device manufacturers
- Customer variation to EIA-481
- Fit of carrier tape to undefined parts.
- Tape selection protocols
- Equipment maintenance
- Carrier tape suppliers
- Custom tape parameters and orders
- Production theory and flow
- Application examples and study



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The final two weeks of this period will be practical applications in the form of hands on operation.

Weeks 19 to 25 – Sub-assemblies and custom parts

Sub-Assemblies and custom parts cover a wide range of customer specific applications. Due to the nature of the work, there is no set itinerary. The trainee will be expected to learn how to:

- Identify the scope of work requested
- Identify tools and supplies needed
- Formulate a plan for production
- Document the production plan
- Conduct a time study to submit for quotation
- Prepare samples for customer approval
- Finalize production documents on customer approval.
- Submit the plan to production scheduling after customer approval.

This training session will involve practical applications of the customized solutions with real time case studies, from conception to production.

Weeks 26 to 36 – Engineering Services

GTL provides a wide range of engineering services to the electronics manufacturing industrial sector. These services are not standardized in any way, and will require the trainee to become familiar with both services provided in the past and those that may arise. During this period the trainee will be assigned to senior staff to observe and obtain practical application knowledge of participate in the delivery of these services to GTL customers.

This section of training will require that the trainee become familiar with all aspects of electrical manufacturing from PCB (Printed Circuit Board) assembly and population to box builds and full turnkey manufacturing. GTL contracts with its customers to provide consultation to provide practical solutions including, but not limited to the following:

- Industrial Engineering
- Component engineering
- Design for Manufacture
- Shop floor processes
- Component refit
- Component coding
- Test engineering

Familiarization with mechanical and electrical engineering as well as basic test software coding will be essential and all come to bear during this section. Training shall include mechanical and electrical engineering concepts.



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Weeks 37 to 39 – Processing requests and creating work instructions

During this period, the trainee will be expected to learn and execute the actual creation of work instructions and order maintenance on the GTL shop floor control software based upon case studies. Trainee will be expected to learn and understand the process documentation from receipt of request through billing and how every step along the way is documented.

The trainee will also be learning all of the software tools within the shop control software that will assist them in processing. Additionally, trainee will field status requests from internal and external customers using the resources available through the control software to assist. Practical application of tools is incidental to the training.



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Weeks 40 to 44 – Load balancing and production flow analysis

During this period, the trainee will learn load balancing and scheduling of all production equipment. The goal is to learn the production capacities and capabilities in order to effectively schedule production. Given the fluid ever changing nature of order inflow at GTL, the trainee must be familiar enough to meet all unscheduled changes to the production flow and respond with a modified plan to meet the changes.

During this period, the trainee will work closely with, and as an expeditor and customer advocate. These skills are crucial in order to give customers timely and accurate information regarding the status of their orders and the feasibility of expedites as well as the scheduling of newly released customer jobs to production. The trainee will shadow current expeditor and customer advocates on rotation. Any practical application will be incidental to the training.



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Weeks 45 to 52 (and beyond) – Case studies and practical applications.

During this period, the trainee will be putting together all elements of prior training in order to analyze and suggest improvements to all processes. The trainee will study new business added in order to determine if the scope and practices need to be modified for more efficient production. It is also during this period that the trainee will be expected to be lead on incoming new customer requests, managing them from inception to completion.

Secondarily, during this time, the trainee will be tasked with auditing and suggesting updates to all production, quality, and regulatory documentation as well as shop control software as a practical application of all the skills and tools learnt throughout the training program.

The trainee will be expected to submit reports and case studies that summarize their findings throughout the training. They will also be asked to suggest changes, modifications and recommendations to the training program for optimal experience and attrition of skills. Recommendations will be incorporated to enhance the training program and its effectiveness.