Municipal Vocational School for Industrial Electronics Munich

EGS	11th Grade/ Specialist Level 1	1 week / 26 lessons	Room: 22.19	Status: 05/05/2026
Modul	IE 2.1 - Power supply			
Learnsituation	Supply of a laboratory room			
Learning Field	Implementing Electrical Power Supply for Devices and Systems and Ensuring safety			

Goals:

- Understanding of AC voltage variables, grid systems and protective measures

Contents:

- Generation of alternating voltage; RMS value, peak value, sine wave voltage
- Mesh Shapes
- Energy distribution; voltage levels; Load curve
- Off-grid and off-grid protection measures
- Protection classes; Protective measures
- RCD and miniature circuit breakers
- Trip characteristics; Loop Impedance

EGS	11th Grade/ Specialist Level 1	1 week / 26 lessons	Room: 22.19	Status: 05/05/2026
Modul	IE 2.2 - Power Supply Devices 1			
Learnsituation	Supply of a laboratory room			
Learning Field	Electrical power supply for devices and systems and their safety			

Goals:

- Behaviour of voltage sources under load
- Internal resistance calculation based on load curves
- Rectification of AC voltages

Contents:

- Soft and rigid voltage sources; Internal resistance
- Transformer
- Diode, PN junction
- Bridge Rectifier
- Capacitor at DC and AC voltage
- Smoothing of Voltage
- Screening

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Modul	IE 2.3 - Power Supply Devices 2			
Learnsituation	Supply of a laboratory room			
Learning Field	Electrical power supply for devices and systems and their safety			

Goals:

- Knowing Options for Voltage Stabilization
- Wiring of fixed voltage regulator
- Determination of efficiency and power dissipation by measurement

Contents:

- Voltage stabilization with Z-diode
- Voltage stabilization with fixed voltage regulator
- Linear Regulators
- Efficiency; Power consumption
- Load characteristic

EGS	11th Grade/ Specialist Level 1	1 week / 26 lessons	Room: 22.19	Status: 05/05/2026
Modul	SG 2.1 - Electronic Assemblies 1			
Learnsituation	Analyzing a crossover			
Learning Field	Designing, manufacturing and testing electronic assemblies of devices			

Goals:

- Analysing the structure of a crossover
- Assign the assemblies to the loudspeaker outputs based on their frequency response
- Graphically represent the ratios of voltages and currents
- Reliable calculation of circuits with R, L and C

Contents:

- Capacitor and coil
- XL and XC
- Series and parallel connection of RC and RL ; Cutoff frequency
- Series connection of R; L;C and Resonant Frequency
- Damping factor; Attenuation
- Logarithmic representation of the frequency response of woofers, midrange drivers and tweeters
- voltage and current triangles; Resistance and conductivity triangle
- Phase displacement

EGS	11th Grade/ Specialist Level 1	1 week / 26 lessons	Room: 22.19	Status: 05/05/2026
Modul	SG 2.2 - Electronic Assemblies 2			
Learnsituation	LF Amplifier - Transistor			
Learning Field	Manufacture and test devices			

Goals:

- Bipolar Transistoren
- bistable, monostable and unstable multivibrators
- Switching power supply
- Setting the operating point
- Setting up the amplifier circuit

Contents:

- Bipolar Transistor Basics
- Principles of operation of multivibrators
- Switching power supply
- Transistor as a switch
- Transistor as amplifier
- Four-quadrant curve field
- LF Amplifier

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Modul	SG 2.3 - Electronic Assemblies 3			
Learnsituation	Fan Control with Op Amp			
Learning Field	Manufacture and test devices			

Goals:

- Be able to size a bridge circuit to convert changes in resistance to changes in voltage
- Be able to use op-amps in a typical circuit variant in the circuit design

Contents:

- NTC- and PTC-resistors (designs, characteristic curves)
- Differentiation between active and passive sensors
- Bridge circuit
- Operational Amplifiers (Characteristics and typ. circuit variants)
- Dimensioning of an amplifier circuit

EGS	11th Grade/ Specialist Level 1	1 week / 26 lessons	Room: 22.19	Status: 05/05/2026
Modul	SG 2.4 - Electronic Assemblies 4			
Learnsituation	Traffic light control with digital circuits			
Learning Field	Designing, manufacturing and testing electronic assemblies of devices			

Goals:

- Setting the clock frequency on an NE555 timer device
- Setting up a counter circuit
- Develop switching functions according to specifications and simplify them with the help of KV diagrams
- Use of the disjunctive normal form
- reading data sheets to understand the functions of integrated circuits

Contents:

- Logical operations
- FlipFlops
- Driver Module
- KV Diagram
- Binary Forward Counter
- Impulsdiagram

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Modul	SG 2.4 - Electronic Assemblies 4			
Learnsituation	Traffic light control with digital circuits			
Learning Field	Designing, manufacturing and testing electronic assemblies of devices			

Goals:

- Setting the clock frequency on an NE555 timer device
- Setting up a counter circuit
- Develop switching functions according to specifications and simplify them with the help of KV diagrams
- Use of the disjunctive normal form
- reading data sheets to understand the functions of integrated circuits

Contents:

- Logical operations
- FlipFlops
- Driver Module
- KV Diagram
- Binary Forward Counter
- BCD - Counter
- Impulsdiagram

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Modul	SG 2.5 - Electronic Assemblies 5			
Learnsituation	Calculator			
Learning Field	Manufacture and test devices			

Goals:

- Understanding of basic operations with digital circuits
- Displaying numbers

Contents:

- Storing data, D-FlipFlop
- Adding two binary numbers. Half adder. Fulladder
- Pullup-Pulldown resistors
- Decoder for 7 Segment display
- Subtraction of binary numbers

EGS	11th Grade/ Specialist Level 1	1 week / 26 lessons	Room: 22.19	Status: 05/05/2026
Modul	ST 2.1 - basic principle of computers			
Learnsituation	basic principle of computers			
Learning Field	Configuring assemblies on the hardware and software side			

Goals:

- Basic understanding of computer processes
- Interface between digital circuits and programming
- Logical Sequences in Computers
- Understanding Shift Registers
- Organization of data storage

Contents:

- ALU 74181
- Bitwise offsetting of AND, OR and XOR logic
- Shift register, right-shift, left-shift and save
- Data storage
- Multiplexer
- Tri-State Driver
- Mnemonic Commands
- Command Converter/Binary Decoder
- Diode-matrix
- Synchronous Counter

EGS	11th Grade/ Specialist Level 1	1 week / 26 lessons	Room: 22.19	Status: 05/05/2026
Modul	ST 2.2 – Arduino programming			
Learnsituation	Arduino programming			
Learning Field	Configuring assemblies on the hardware and software side			

Goals:

- Basic understanding of Arduino programming
- PAP – Be able to read and create program schedules
- Knowledge of the different types of variables
- Memory Address Calculation in the Hexadecimal System
- Programming of multiple 7-segment displays

Contents:

- Arduino Board and Programming Interface
- PAP – Program Schedules
- Variables
- Arduino Output and Input Pinout
- if – instruction
- for - loop
- Types of Storage
- Hexadecimal system
- Calculating Memory Addresses
- Multiplexing 7 segment displays

EGS	11th Grade/ Specialist Level 1	1 week / 26 lessons	Room: 22.19	Status: 05/05/2026
Modul	ST 2.3 – Arduino programming of stepper Motor			
Learnsituation	Arduino programming			
Learning Field	Configuring assemblies on the hardware and software side			

Goals:

- Using the Serial Monitor
- Understanding AD Converter
- Be able to distinguish different types of stepper motors
- Understanding the mode of operation of stepper motors
- Controlling stepper motors with unipolar or bipolar drivers
- Programming Interrupts

Contents:

- Serial monitor on the Arduino
- AD Converter
- Unipolar und bipolar Schrittmotore
- Full and half-step operation
- Structure and functionality of a stepper motor
- Programming Interrupts

EGS	11th Grade/ Specialist Level 1	1 week / 26 lessons	Room: 22.19	Status: 05/05/2026
Modul	ST 2.4 – Arduino programming of Servo Motor			
Learnsituation	Arduino programming			
Learning Field	Configuring assemblies on the hardware and software side			

Goals:

- Understanding PWM
- Arduino programming of Servo Motor
- Project

Contents:

- PWM