IFEN — Institut für EEG-Neurofeedback
Issued: 25/08/2026
Version: 1.0

36 hours of BCIA-approved neurofeedback didactic education

Asynchronous online curriculum aligned with the BCIA Blueprint of Knowledge for Neurofeedback

Hour allocation by blueprint domain

DOMAIN	TITLE	HOURS
I	Orientation to Neurofeedback	4
II	Basic Neurophysiology & Neuroanatomy	4
III	Instrumentation & Electronics	4
IV	Research Foundations	2
V	Psychopharmacology Considerations	2
VI	Treatment Planning	4
VII	NF Measurement & Interpretation (qEEG)	6
VIII	Neurofeedback Treatment	6
IX	Current Trends in Neurofeedback	2
X	Ethical & Professional Conduct	2
	Total	**36**

Competence levels in detail

I · Competence level 1 — Orientation to Neurofeedback

4 hrs

Purpose: Understand what neurofeedback is, how the nervous system regulates itself, and why the brain can learn through feedback.

Explain the relationship between biofeedback and neurofeedback to a client. Describe the role of the autonomic nervous system in self-regulation. Articulate why the brain can change its own electrical patterns through feedback. Identify the foundational learning principles — habituation, conditioning, shaping, and reinforcement — that make neurofeedback effective.

Learning objectives

- Define neurofeedback and distinguish it from general biofeedback
- Describe the role of the autonomic nervous system in self-regulation
- Describe the structural organisation of the nervous system (CNS, PNS, ANS)
- Explain the roles of the sympathetic and parasympathetic divisions
- Define biofeedback as an umbrella term encompassing multiple physiological modalities
- List the major biofeedback modalities (EMG, HRV, EDA, temperature, EEG)
- Explain operant conditioning and its application to brain activity
- Describe shaping as a method of progressive approximation

Building blocks

1.1	What Is Neurofeedback? Definition & Core Principles	0.6 hrs
1.2	The Nervous System: CNS, PNS & Autonomic Regulation	0.6 hrs
1.3	Biofeedback vs. Neurofeedback: Scope & Distinctions	0.6 hrs
1.4	Learning Theory: Operant Conditioning, Shaping & Reinforcement	0.6 hrs
1.5	Foundations Knowledge Check	0.3 hrs
1.6	Neuroplasticity: Sprouting, Pruning & the Capacity for Change	0.6 hrs
1.7	The Yerkes-Dodson Law: Arousal & Optimal Performance	0.6 hrs

II · Competence level 2 — Neurophysiology & the Origin of the EEG Signal 4 hrs

Purpose: Understand how neurons generate the electrical signals we measure at the scalp — from single-cell dipoles to synchronized cortical rhythms.

Explain the bioelectric origin of EEG in terms of pyramidal cell dipoles and volume conduction. Describe how thalamocortical cycles produce rhythmic brain activity. Differentiate between spontaneous EEG, event-related potentials, and slow cortical potentials. Identify the functional significance of major cortical lobes and their relevance to electrode placement.

Learning objectives

- Describe how ionic gradients create neuronal excitability
- Differentiate action potentials from postsynaptic potentials
- Explain the structural reason pyramidal cells generate measurable dipoles
- Describe how synchrony determines visibility of cortical activity at the scalp
- Describe the role of the thalamus in pacing cortical activity
- Explain how thalamocortical loops generate rhythms such as alpha and sleep spindles
- Name the cortical lobes and their main functional contributions
- Map common 10-20 sites (Fz, Cz, Pz, T-sites, O1/O2) to underlying regions

Building blocks

2.1	How Neurons Generate Electrical Signals	0.6 hrs
2.2	Pyramidal Cell Dipoles, Synchrony & Volume Conduction	0.6 hrs
2.3	Thalamocortical Resonance & Rhythmic Brain Activity	0.6 hrs
2.4	Functional Neuroanatomy: Cortical Lobes & Their Roles	0.6 hrs
2.5	Neurophysiology Knowledge Check	0.3 hrs
2.6	Event-Related Potentials & Slow Cortical Potentials	0.6 hrs
2.7	The Concentration–Relaxation Cycle & EEG Amplitude	0.6 hrs

III · Competence level 3 — Instrumentation & Electronics 4 hrs

Purpose: Master the technical foundations of EEG recording — from impedance and amplifiers to filters, the electrode system, and montage selection.

Explain impedance and its impact on EEG signal quality. Describe how differential amplifiers work and why high common mode rejection matters. Apply sampling principles to understand why filter settings affect your data. Place electrodes using the standardised positioning system. Choose appropriate montage configurations for different clinical purposes.

Learning objectives

- Define impedance and explain its role at the electrode-skin interface
- Describe the stages of the EEG signal chain from scalp to screen
- Explain the working principle of a differential amplifier
- Describe what common mode rejection (CMR) does and why it matters
- Distinguish high-pass, low-pass, notch and anti-aliasing filters by purpose
- Recognise that every filter changes the signal, including its phase
- Locate nasion, inion and preauricular points and use them as measurement landmarks
- Explain how 10-20 site labels encode region and hemisphere

Building blocks

3.1	Impedance & the EEG Signal Chain	0.5 hrs
3.2	Differential Amplifiers & Common Mode Rejection	0.5 hrs
3.3	Filters: High-Pass, Low-Pass, Notch & Anti-Aliasing	0.5 hrs
3.4	The Standardised Electrode Positioning System	0.5 hrs
3.5	Montage Selection: Unipolar, Bipolar & Multi-Channel	0.5 hrs
3.6	Instrumentation Knowledge Check	0.3 hrs
3.7	Sampling Rate, Nyquist Principle & Digital Conversion	0.5 hrs
3.8	Spectral Analysis & Fourier Transform Basics	0.5 hrs

IV · Competence level 4 — EEG Frequency Bands & Clinical Correlates 2 hrs

Purpose: Learn the major EEG frequency bands — from Delta through Gamma — and understand what each reveals about brain states and clinical conditions.

Identify and describe each major EEG frequency band and its functional significance. Recognise clinical patterns associated with excess or deficit in specific bands. Understand the concept of Alpha Peak Frequency and its individual variability. Explain the relevance of the Mu rhythm at central sites.

Learning objectives

- Name the frequency ranges of delta, theta and alpha and their typical functional meaning
- Distinguish posterior alpha at rest from drowsiness-related theta
- Define SMR, beta and high beta and their typical frequency ranges
- Describe the functional state classically associated with each band
- Locate gamma in the EEG spectrum and outline its proposed functional role
- Explain why gamma is especially vulnerable to muscle and movement artefact
- Define individual alpha peak frequency (IAPF) and how it is identified
- Describe age- and state-related variation in alpha peak frequency

Building blocks

4.1	Delta, Theta & Alpha: Slow-Wave Foundations	0.3 hrs
4.2	SMR, Beta & High Beta: Sensorimotor and Cognitive Rhythms	0.3 hrs
4.3	Gamma & Higher-Order Cognitive Binding	0.3 hrs
4.4	Frequency Bands Knowledge Check	0.2 hrs
4.5	Alpha Peak Frequency & Individual Variability	0.3 hrs
4.6	Frontal Alpha Asymmetry & Mood Regulation	0.3 hrs
4.7	The Mu Rhythm: Sensorimotor Significance	0.3 hrs

V · Competence level 5 — Historical Development & Evidence

2 hrs

Purpose: Trace the scientific lineage of neurofeedback from the discovery of brain electricity to modern evidence-based practice.

Describe the key milestones in the development of EEG and neurofeedback. Explain how early animal and human studies established that brain electrical activity could be trained. Identify the major research contributions that led to clinical applications for seizures, attention, and deep-state training. Evaluate evidence levels and distinguish between well-supported and experimental applications.

Learning objectives

- Name the key 19th-century findings that established brain electricity
- Identify Hans Berger as the recorder of the first human EEG and place it in time
- Name the pioneers of operant EEG training and their core findings
- Describe Sterman's cat study and its translation to human epilepsy
- Name the AAPB/ISNR efficacy levels and what each implies
- Identify the elements that strengthen a study (controls, blinding, randomisation, replication)
- Summarise Sterman's findings on SMR training and pharmacoresistant epilepsy
- Outline the Lubars' ADHD research and the theta/beta protocol

Building blocks

5.1	Origins: From Brain Electricity to the First Human EEG	0.4 hrs
5.2	Pioneers of Neurofeedback & Key Clinical Discoveries	0.4 hrs
5.3	Evidence Levels & How to Evaluate Research Quality	0.4 hrs
5.4	Historical & Evidence Knowledge Check	0.3 hrs
5.5	Seminal Studies: Seizure Reduction, Attention & Deep States	0.4 hrs
5.6	Research Designs: From Case Studies to Controlled Trials	0.4 hrs

VI · Competence level 6 — Psychophysiological Foundations & Pharmacology

4 hrs

Purpose: Understand how biofeedback modalities complement neurofeedback, and how medications and substances alter the EEG signals you measure.

Describe how biofeedback modalities like electrodermal activity and temperature relate to the stress response. Identify how major medication classes alter EEG patterns. Recognise when substance use may be affecting assessment results. Account for pharmacological influences when interpreting brain activity data.

Learning objectives

- Describe what EDA, peripheral temperature, heart rate and HRV physiologically reflect
- Interpret typical resting and stress patterns for each modality
- Explain why medication can mimic, mask, or reshape clinically relevant EEG features
- Recognise the typical EEG directions of the major medication classes
- Build a structured intake that captures medication, substances, and dose timing
- Decide when (and whether) to record a baseline relative to the medication cycle
- Distinguish what HEG measures (blood flow / thermal output) from what EEG measures (electrical rhythms)
- Describe the two main HEG approaches: near-infrared (nirHEG) and passive infrared (pirHEG)

Building blocks

6.1	Biofeedback Modalities: EDA, Temperature & Cardiac Parameters	0.7 hrs
6.2	How Medications Alter EEG Patterns	0.7 hrs
6.3	Accounting for Pharmacological Effects in Assessment	0.7 hrs
6.4	Psychophysiology & Pharmacology Knowledge Check	0.3 hrs
6.5	Hemoencephalography: Brain Thermal Output	0.7 hrs
6.6	Substance Use & Recreational Drugs: EEG Signatures	0.7 hrs

VII · Competence level 7 — Client Assessment & Clinical Orientation 6 hrs

Purpose: Conduct a thorough intake process, interpret standardised EEG baselines, and form a clinical working hypothesis using multiple data sources.

Conduct a structured clinical intake interview. Record and interpret standardised EEG baselines with awareness of normative distributions. Read topographical brain maps and understand coherence displays. Apply the triangulation principle: combine at least three independent data sources to form a clinical hypothesis. Administer and interpret continuous performance assessments where appropriate.

Learning objectives

- Cover the full breadth of a structured intake without turning it into a checklist ritual
- Translate presenting symptoms and history into testable clinical hypotheses
- Record baselines under consistent, repeatable conditions
- Define and clearly separate eyes-open and eyes-closed conditions
- Explain what qEEG adds beyond single-channel EEG traces
- Read topographical z-score maps using the standard colour scale
- Combine at least three independent data sources into one working hypothesis
- Distinguish converging from conflicting evidence and respond appropriately

Building blocks

7.1	Intake Assessment: Interview, History & Presenting Symptoms	0.8 hrs
7.2	Standardised EEG Baselines & Normative Reference Values	0.8 hrs
7.3	Quantitative EEG: Topographical Maps & Connectivity	0.8 hrs
7.4	Triangulation: Forming a Clinical Hypothesis	0.8 hrs
7.5	Reading a Quantitative EEG Report	0.8 hrs
7.6	Assessment Knowledge Check	0.4 hrs
7.7	EEG Phenotypes & Symptom Mapping	0.8 hrs
7.8	Continuous Performance Tests & Neuropsychological Screening	0.8 hrs

VIII · Competence level 8 — Training Design & Protocol Logic 6 hrs

Purpose: Design neurofeedback training plans based on clinical reasoning — from standard protocols to individualised, assessment-guided approaches.

Identify and describe the major standard neurofeedback protocols and their clinical purposes. Design augmenting (reward) and inhibiting training strategies. Differentiate low-frequency from high-frequency training in terms of goals, effort, and feedback design. Transition from standard protocols to assessment-guided individualised training plans. Select appropriate training sites based on the relationship between brain regions and presenting symptoms.

Learning objectives

- Trace the path from early symptom-based recipes to individualised, assessment-driven protocols
- Identify operant conditioning as the shared learning mechanism across protocol families
- Name the major standard protocols and the clinical pictures they were developed for
- Match a presenting complaint to a reasonable starting protocol with a clear rationale
- Distinguish low- and high-frequency protocol families along physiology, learning demand, and clinical fit
- Choose the appropriate frequency range for a given clinical picture and client capacity
- Explain why standard protocols must be individualised rather than copied
- Name the main individualisation levers: site, band, threshold, duration, pacing, sequencing

Building blocks

8.1	Evolution of Neurofeedback Protocols	0.7 hrs
8.2	Standard Protocols & Their Clinical Applications	0.7 hrs
8.3	Low-Frequency vs. High-Frequency Training Design	0.7 hrs
8.4	From Standard Protocols to Individualised Training	0.7 hrs
8.5	Case-Based Protocol Design	0.7 hrs
8.6	Training Design Knowledge Check	0.4 hrs
8.7	Deep States Training: Principles & Safeguards	0.7 hrs
8.8	Connectivity-Based & Coherence Protocols	0.7 hrs
8.9	Symptom-to-Protocol Mapping	0.7 hrs

IX · Competence level 9 — Session Conduct, Safety & Signal Quality 2 hrs

Purpose: Master the practical mechanics of conducting safe, effective neurofeedback sessions — from artefact management to client care.

Identify and classify common EEG artefacts and their sources. Apply artefact avoidance strategies in a clinical setting. Implement pre-session, during-session, and post-session safety checklists. Prepare clients for neurofeedback including orientation and expectation management. Set appropriate amplitude thresholds and monitor training progress. Recognise drowsiness, adverse reactions, and contraindications during sessions. Use coaching and reinforcement strategies to support client learning.

Learning objectives

- Name the most common artefact categories in clinical EEG
- Distinguish ocular, muscular, cardiac, movement and environmental sources
- Apply a structured signal-quality routine before each recording
- Use skin preparation, electrode placement and impedance balancing correctly
- Run a structured pre-session screening that catches contraindications and red flags
- Monitor the client during training for early signs of overload or adverse response
- Explain neurofeedback to a new client in clear, non-mystifying language
- Set realistic expectations about timeline, sensations, and 'doing nothing'

Building blocks

9.1	Types of EEG Artefacts & How to Identify Them	0.2 hrs
9.2	Artefact Prevention & Signal Quality Management	0.2 hrs
9.3	Safety Principles & Session Checklists	0.2 hrs
9.4	Client Preparation, Orientation & Coaching	0.2 hrs
9.5	Threshold Setting, Progress Monitoring & Adjustment	0.2 hrs
9.6	Session Conduct Knowledge Check	0.2 hrs
9.7	Adverse Effects, Contraindications & Risk Mitigation	0.2 hrs
9.8	Client Education: Language, Nutrition & Support	0.2 hrs
9.9	Pre/Post-Session Questionnaires & Outcome Tracking	0.2 hrs
9.10	Abnormal EEG Patterns & When to Refer	0.2 hrs

X · Competence level 10 — Professional Responsibility, Trends & Ethics 2 hrs

Purpose: Uphold the ethical standards that define responsible practice, and understand emerging approaches that shape the future of the field.

Apply professional standards and ethical principles to clinical practice. Distinguish between well-supported and experimental applications in client communication. Ensure advertising and public statements are accurate and appropriate. Implement informed consent procedures and maintain professional boundaries. Explain the difference between surface amplitude training and normative database-guided approaches. Describe source localisation methods and their clinical potential. Evaluate emerging methods critically based on available evidence.

Learning objectives

- Name the core ethical commitments that govern neurofeedback practice
- Distinguish honest clinical communication from marketing language
- Define scope of practice in terms of training, credentials, and professional role
- Identify boundary situations that call for supervision, co-treatment, referral, or refusal
- Describe how normative-database-guided training works in clinical terms
- Distinguish statistical deviation from clinical pathology
- Explain how source localisation attempts to estimate cortical generators from scalp recordings
- Distinguish inverse-problem methods (e.g. LORETA, sLORETA, MNE) by their core assumptions

Building blocks

10.1	Professional Standards & Ethical Principles	0.3 hrs
10.2	Scope of Practice, Boundaries & Informed Consent	0.3 hrs
10.3	Current Trends: Normative Database-Guided Training	0.3 hrs
10.4	Source Localisation & Region-of-Interest Approaches	0.3 hrs
10.5	Professional Responsibility & Trends Knowledge Check	0.3 hrs
10.6	Advertising, Marketing & Public Communication	0.3 hrs
10.7	Well-Supported vs. Experimental Applications	0.3 hrs
10.8	Multi-Channel Approaches & Future Directions	0.3 hrs

Method, assessment and records

- Delivery: asynchronous online learning with text, figures, videos, exercises and knowledge checks.
- Assessment: one knowledge check per competence level; open answers are evaluated on content.
- Hour allocation: each building block carries a fixed share of minutes, summing to exactly 36 hours.
- Records: per-block progress log, logbook for mentoring, personal and client sessions, PDF exports.
- Languages: German and English, switchable at any time.
- Not part of these 36 hours: the neuroanatomy/neurophysiology course, mentoring, personal and client sessions.

Contact

IFEN — Institute for EEG Neurofeedback · info@neurofeedback-info.de · neurofeedback-ifen.com