

QEEG CERTIFICATION PROGRAM

**(24 Hours Accredited Instruction)**

**Level: Introductory to Intermediate**

**Instructors:   
Cynthia Kerson, PhD, QEEGD, BCN, BCB**

**John LeMay, MA, MFT, QEEGT, BCN, BCB**

**Practice Gap:**

In spite of a growing body of research, quantitative electroencephalography (QEEG) as an assessment modality is only beginning to gain recognition in psychological and health sciences. In research settings, QEEG has been used to explore depression, anxiety, post-traumatic stress disorder, ADHD, dyslexia, mild traumatic brain injury, cognitive decline and optimal performance to name a few areas. It is used to inform neurofeedback therapies. As a functional analysis tool, QEEG has increasingly shown promise in helping the psychologist understand and treat patient symptoms and complaints in relation to dysregulated brain networks. To use this tool to its fullest extent, it is necessary that the practitioner gain competence in adequately acquiring and interpreting a QEEG record, understanding the relevant research, and applying the results within an appropriate scope of practice. This requires not only a technical knowledge, but also an understanding of cortical systems and their connectivity, as well as proper editing and database analysis. The psychologist or health practitioner would be presented with the current best practice and research for appropriately utilizing this tool.

**Educational need:**

Participants will have the opportunity to develop improved understanding of the psychological, behavioral and physiological correlates of brain regulation and de-regulation using as QEEG evaluation with the goal of enhancing and informing treatment interventions, such as neurofeedback.

**Abstract:**

This face-to-face, three-day course will provide a foundation for understanding the importance of QEEG including LORETA (Low Resolution Electromagnetic Tomography) analysis for understanding basic brain function. This includes recording and analysis of multichannel EEG, evaluating and reducing artifacts and using the data to develop neurofeedback protocols.

**Objectives for this 3-day course:**

1. The attendee will broaden his knowledge of QEEG recording, artifacting and analysis,
2. The attendee will be introduced to brain wave connectivity measures to ensure fundamental knowledge of this paradigm of brain activity while training the client,
3. The instructor will inform how to develop neurofeedback protocols based on QEEG analysis and databases so the psychologist can make protocol decisions based upon them
4. The instructors will provide a deeper understanding of the generators of the EEG to better inform the practitioner when deciding treatment plans, this will be done from a neurophysiological perspective and help the learner translate this information into wave form morphology
5. The instructor will provide an understanding of Z-score analysis for QEEG to equip the psychologist in developing treatment plans, and providing assessment reports.
6. Participants will be provided with case presentations and their analyses in order to better understand course concepts and how to translate these into reports and treatment plans…
7. Current status and future trends in QEEG, neurofeedback and neuromodulation will be discussed to better equip the attendee with the many facets of research and the clinical efficacy of the treatment for many psychological disorders
8. The attendee will become better prepared for QEEG certification to show competency in this area of treatment

**COURSE OUTLINE**

*NOTE: There will be an optional, hands-on practicum review during one evening of the course. Time and place will be determined on Day 1. In addition, a short review quiz will be assigned as homework at the end of each day.*

**Day 1: 8 hours**

1) ORIENTATION AND INTRODUCTIONS, 8:00-8:30 a.m. LeMay

Attendees meet instructors, discuss overview of course, arrange optional practicum, and review QEEG certification requirements. (20 minutes)

2) INTRODUCTION TO EEG AND QEEG, 8:30- 9:30 a.m. LeMay

This will include a basic overview, from the recording to the montaging to spectral maps, glossary of terms for the class (1 hr Montaging/Spectral/Topographical) *QEEGCB Blueprint Area 5a,c*

*3)* DEMONSTRATION: MULTI-CHANNEL EEG RECORDING, 9:30-10:30 a.m. LeMay

This will be a hands-on exercise. Participants will receive instruction and work in pairs to practice preparation, impedance checking, signal evaluation, recording, storage, equipment care and recording hygiene. (.75 hr Practicum) *QEEGCB Blueprint Area 6*

*BREAK, 10:30–10:45 a.m.*

*15 Minutes*

*4)* PRACTICUM 1.2: RECORDING, 10:45 a.m. – 12:30 p.m. LeMay

This will be a hands-on exercise. Participants will receive instruction and work in pairs to practice preparation, impedance checking, signal evaluation, recording, storage, equipment care and recording hygiene. (2.25 hr Practicum) *QEEGCB Blueprint Area 6*

LUNCH, 12:30 p.m. to 1:30 p.m.

1 hour

6) MONTAGES, SPECTRAL AND TOPOGRAPHICAL PROCESSING, 1:30-2:30 p.m. LeMay

Participants will view the EEG in multiple montages to understand findings and relate them to spectral analysis and topographical mapping. (1.5 hr Montaging/Spectral/ Topographical) *QEEGCB Blueprint Area 5b*

7) EDITING THE “NORMAL” EEG, 2:30-3:30 p.m. Kerson

An exploration of artifact identification, identifying components of the EEG, automatic artifacting techniques, independent component analysis, and gathering statistically reliable and representative data. This section will be include discussion, Power Point and software examples. (1.25 hr Editing and Artifacting) *QEEGCB Blueprint Area 1 a,c*

BREAK, 3:30–3:45 a.m.

15 Minutes

8) EDITING, 3:45- 4:45 p.m. Kerson

An in-depth exploration of artifact identification, identifying components of the EEG, automatic artifacting techniques, independent component analysis, and gathering statistically reliable and representative data. This section will be include discussion, Power Point and software examples. (.75 hr Artifacting and Editing) *QEEGCB Blueprint Area 1 a,c*

9) PRACTICUM 2: ARTIFACT DETECTION, 4:45-5:30 p.m. Kerson

Participants will be provided with an EEG record to artifact using either WinEEG, BrainDX or NeuroGuide demo software. They will finish by converting artifacted data to spectral maps. Artifacting will be reviewed and discussed after the exercise. (1.5 hr Practicum) *QEEGCB Blueprint Area 6*

**Day 2: 8 hours**

* *Practicum — 1.5 hour*
* *Database Analysis — 3 hours*
* *Clinical and cognitive aspects — 3.5 hours*

*1)* COHERENCE AND CONNECTIVITY, 9:00-10:30 a.m. Kerson

Participants will gain receive an introduction to timing and connectivity within brain networks and modules. (.5 hr Montaging/Spectral/ Topographical) *QEEGCB Blueprint Area 5d*

2) DATABASE ANALYSIS 1.1, 10:30-11:00 a.m. Kerson

Participants will gain an understanding of database evaluation and analysis — what’s in a database, what the maps say (and don’t say) using software examples, discussion and Power Point .(.5 hr Database Analysis) *QEEGCB Blueprint Area 3a*

BREAK, 11:00-11:15 a.m.

15 Minutes

3) STATISTICAL PROCESSING, 11:15 a.m.-12:30 p.m. LeMay

Participants will review concepts of statistical reliability and significance as they pertain both to database and analysis and stability of the record. (.5 hr Database Analysis) *QEEGCB Blueprint Area 3c*

LUNCH, 12:30-1:30 p.m.

1 Hour

4) BRODMANN AREA STRUCTURE AND FUNCTION, 1:30-2:30 p.m. Kerson

Attendees will consider symptoms and complaints, as well as findings in the EEG in relation to Brodmann areas. (1 hr Clinical and Cognitive aspects) *QEEGCB Blueprint Area, 4d*

5) THE CLINICAL, THE COGNITIVE AND THE ABNORMAL EEG, PART 1, 2:30-3:30 p.m. Kerson

Participants will consider origins of the EEG, a developmental perspective of the EEG, abnormal findings and collaboration with other treatment providers. (Clinical and Cognitive Aspects 1 hr) *QEEGCB Blueprint Area 1b; 4 a,b*

BREAK 3:30-3:45 p.m.

15 Minutes

6) PRACTICUM, 3:45-5:30 p.m. Kerson & LeMay

An evidence-based discussion of findings on cognitive function, clinical aspects and abnormal features on the EEG. (Clinical and Cognitive Aspects 1.5 hr) *QEEGCB Blueprint Area 4 c,g*

**Day 3: 8 hours**

* *Database analysis — 1.5 hours*
* *Clinical and Cognitive aspects — 3 hours*
* *Drug effects — 2 hours*
* *Practicum — 1.5 hours*
* *Closing — .25 hour*

1) DRUG EFFECTS, 8:00-10:00 a.m. Kerson

Attendees will review drug interactions on the EEG, washout periods, and considerations for analysis and training. (2hr Drug Effects) *QEEGCB Blueprint Area 2a*

BREAK, 10:00-10:15 a.m.

15 Minutes

2) LORETA ANALYSIS, 10:15-11:15a.m. LeMay

Participants will be introduced to LORETA analysis and related database processing. (1 hr Database Analysis) *QEEGCB Blueprint Area 4e*

3) THE CLINICAL, THE COGNITIVE AND THE ABNORMAL EEG, PART 3, 11:15 a.m. - 12:15 p.m. Kerson

(1 hr Clinical and Cognitive Aspects) *QEEGCB Blueprint Area 4f*

LUNCH 12:15-1:15 p.m.

1 hour

5) USING LORETA TO UNDERSTAND CLINICAL AND COGNITIVE ASPECTS, 1:15-3:15 p.m. LeMay

Participants will receive an introduction to basic LORETA analysis and processing to isolate findings in the EEG and to better understand clinical and cognitive issues in the patient. (1.5 hr Clinical and Cognitive Aspects) *QEEGCB Blueprint Area 4e*

BREAK, 3:15-3:30 p.m.

15 Minutes

6) USING LORETA TO UNDERSTAND CLINICAL AND COGNITIVE ASPECTS, CONTINUED 3:30- 4:30 p.m. LeMay

(.5 hr Clinical and Cognitive Aspects) *QEEGCB Blueprint Area 4e*

7) PRACTICUM 3 — DATA ANALYSIS, 4:30- 5:30 p.m. Kerson & LeMay

Participants will use software to conduct a data analysis and share conclusions. (1.5 hr Practicum) *QEEGCB Blueprint Area 6*

8) CLOSING, 5:30-5:45 p.m.

A time will be provided for closing questions and comments, as well as course questionnaires.

**References:**

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[ASET Booklet](http://qeegcertificationboard.org/wp-content/uploads/2013/06/ASET-Booklet.pdf) – Compilation of EEG materials from the American Society of Electrodiagnostic Technologists.

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