**APEd**

**BCIA Biofeedback Certification Program**

**42-Hour Program**

Instructors: Chris Gilbert, PhD, BCB and Cynthia Kerson, PhD, QEEGD, BCN, BCB

**Abstract:** Biofeedback is an up and coming modality that utilizes operant conditioning to regulate physiological state. It is a form of applied psychophysiology – a union of psychology and physiology. There are many research publications showing efficacy with stress reduction, AD/HD, PTSD, anxiety, substance abuse to name a few. A medical and/or psychological practitioner may, under the scope of his license, practice this intervention. It is essential that the practitioner gains full knowledge of the anatomical and physiological features of the body systems being trained and understands the likely objective and subjective reactions. A medical professional would be brought to current knowledge about psychological implications and a psychologist would be brought to current understanding about the organic issues.

This 42-hour course provides practical learning for certification in biofeedback. The instructors discuss the concepts of the origins, learning principles, best training protocols, and treatment plans for specific presentations for biofeedback and adjunct approaches. This course will demonstrate biofeedback recording and training procedures with state of the art instrumentation and will prepare the clinician for providing biofeedback in his practice

**Resources and Recommended Reading:**

Andreassi, J. (2000). *Psychophysiology: Human behavior & Psychological Response*. Erlbaum Assoc.

 New Jersey.

Basmajian, J. (ed). (1989). *Biofeedback: Principles and practice for clinicians* 3rd Ed. Williams &

 Wilkins.

Davis, M., Robbins Eshelman, E. & Mckay, M. (1995). *The relaxation & stress reduction workbook*.

 4th Ed. New Harbinger Publications, Inc.

Everly, G.S. & Lating, F.J. (2002). *A Clinical Guide to the Treatment of the Human Stress Response* 2nd

 Ed. Plenum, NY.

Hanna, T. (1988). *Somatics: reawakening the mind’s control of movement flexibility and health*.

 Perseus Books, MA.

Khazan, I. (2013). *The Clinical Handbook of Biofeedback.* Wiley-Blackwell, Sussex, UK.

Lehrer, P. & Wollfolk, RL. (eds.). (1993). *Principles and practice of stress management*: 2nd Ed.

 Guilford Press, NY.

Peper, E., Tylova, H., Gibney, K., Harvey, R. & Combatalade, D. (2008). *Biofeedback mastery: An*

 *experiential teaching and self-training manual.* AAPB, Wheat Ridge, CO.

Seaward, BL. (2002). *Managing stress: principles and strategies for health and wellbeing*. 3rd Ed.

 Jones and Bartlet Publishers, Boston.

Sapolsky, R. 2000). W*hy zebras don’t get ulcers: An updated guide to stress, stress-related diseases*

 *and coping*. Barnes and Noble Books, NYC.

Schwartz, M. & Andeasik, F. (2003). *Biofeedback: A practitioner’s guide*. 3rd Ed. Guilford Press, NY

Sherlin, L., Arns, M., Lubar, J., Heinrich, H., Kerson, C., Strehl, U., Sterman, M. B.

(2011). Neurofeedback and basic learning theory: Implications for research and the clinic. *J. Neurotherapy*:15(4). 292-304.

Sherman, R.A. (2011). *Pain:* *Assessment and Intervention from a Psychophysiological Perspective*

 AAPB, Wheat Ridge, CO.

Swami Rama, Ballentine, R & Hymes, A. (1998). *Science of breath: A practical guide*. Himalayan

 Institute Press. Honesdale, PA

Objectives:

1. The attendee will gain a foundational knowledge of the history, development and relevant research relating to the emergence of biofeedback and subsequent biofeedback operant conditioning.
2. When providing biofeedback, it is fundamental to understand the structure and behaviors of the body’s systems at the functional level. This course introduces the concepts of biological physiology and neuroanatomy and how they are important to the psychologist in developing biofeedback treatment plans.
3. The attendee will be oriented to the nature of operant conditioning and its applications with biofeedback, and to provide a mechanism for which the psychologist can rely while training the client.
4. The instructor will provide practical training to facilitate an understanding of the equipment, electronic and instrumentation concepts so the actual physiological acquisition is without artifact and provides clean recording.
5. Demonstration and trainings with biofeedback instrumentation will be provided in small group settings. This is to build confidence in the psychologist’s ability to manipulate the equipment and to provide safety guidelines for the psychologist while training the client.
6. Understanding how the body interacts with medications and how these interactions affect physiological measure is vital. Many clients appear medicated and/or ascertain new prescriptions while undergoing biofeedback training. The psychologist will understand these mechanisms better.
7. Because there are ethical issues specific to biomodulation and brain training, the instructor will discuss them to better prepare the psychologist.
8. Because there are relevant clinical populations and non-candidates for biofeedback training, the psychologist will be briefed on how to discern them. Additionally, the best protocols, based upon the assessment and the client’s presentation, will be discussed.
9. The attendee will be better prepared to sit for the BCIA certification exam to show competence in this area of treatment.

***Day 1: Cynthia Kerson | 8.5 hours***

*Introductions*

8:00 – 8:30

A short introduction from your instructor as well as all attendees.

1. *Introduction to Biofeedback: Its History and Learning Concepts | Cynthia Kerson*

8:30 – 10:30 | 2 hours | BCIA blueprint areas I.A, I.B, I.C & I.D

This section takes a look at the beginnings of psychological measure, from the first measurements of animal and then human electrophysiological systems. It leads you to current paradigms through the concepts of cybernetics, operant conditioning and self-regulation. It will also look at the development of the institutional bodies, basic theoretical underpinnings of classical and operant conditioning and assumptions based upon self-regulation, feedback and feed forward concepts.

Break 10:30-10:45 | .25 hours

1. *Autonomic Applications (section 1 of 3) Cynthia Kerson*

10:45 - 12:15 including lunch break | 2 hours | BCIA blueprint area VI

Mechanisms of arousal are important when considering psychophysiological intervention. The cardiovascular, electrodermal, electromyographic, gut and respiratory systems are considered. In this section, the attendee with gain knowledge of the anatomy and physiology of these autonomic nervous system (ANS) systems including their patterns of behavior, known as sympathetic and parasympathetic arousal. Additionally, concepts such as tonic, phasic and spontaneous patterns, adaptation and habituation will be discussed.

Lunch 12:15 – 1:15 | .25 hours

1. *Autonomic Applications (section 2 of 3) Cynthia Kerson*

1:15- 3:15 | 3 hours including 1-hour lunch break | BCIA blueprint area VI

Continuation of above.

Break 3:15-3:30 | .25 hours

1. *Psychophysiological Recording/ Cynthia Kerson*

3:30 – 5:30| 2 hours | BCIA blueprint area III

This section will introduce through demonstration the main areas of biofeedback, including cardiovascular properties, electromyography, electrodermal activity, thermography, oximetry and respiration. We will perform a tracking test as well as look at electronic issues.

1. *Day 1 Review Quiz*

30 minutes | Group responses to the day’s quiz

***Day 2: | Chris Gilbert and Cynthia Kerson | 8.5 hours***

*Introductions*

8:00 – 8:30

A short introduction from your instructor as well as all attendees.

1. *Electronic Concepts Relevant to Psychophysiological Recording | Cynthia Kerson*

8:30-9:30 | 1 hour | BCIA blueprint area III

Ohms law, impedance, amplifiers, bandpass, telemetry and artifacts are important concepts for the applied psychophysiologist. To perform optimally, the clinician needs to understand these guidelines and their recording practices meet them. Without this basic knowledge, the adage, “garbage in – garbage out” will likely apply and the training will be ineffective.

1. *Stress, Coping and Illness / Chris Gilbert*

9:30 – 12:45 | 3 hours with 15-minute break | BCIA blueprint area III

This section summarizes relationships between variables of stress (biochemical, physiological, emotional) and health disturbances from biosocial, transactional, allostatic load and dysponesis. The stress concept emphasizes current understanding of "allostatic load" (attempts to maintain homeostasis) in various systems, for both acute and chronic stress. Coping methods are seen as personal resources and techniques to reduce the overload aspects of stress. We will cover stress assessment and psychoneuroimmunology, including beneficial effects of relaxation techniques facilitated by biofeedback training.

Lunch 12:45-1:45 | 1 hour

1. *Respiratory Applications: Capnometry and Relaxation Breath Work | Chris Gilbert*

1:45 – 3:45 | 2 hours | BCIA blueprint area

Breathing regulation is very accessible, and fundamental to other psychophysiological modalities. This section will focus on theoretical and practical aspects of breathing training, including capnometry, or the measure of CO2 in exhaled air. Demonstration of CO2 monitoring will show its value as a check on normal blood chemistry and presence of hyperventilation.

Break 3:45 – 4:00 | .25 hour

1. *Psychophysiological Recording/ Chris Gilbert*

4:00 – 6:00 | 2 hours | BCIA blueprint area VII

This section will expand upon yesterday’s demonstration and begin practical training in the main areas of biofeedback, including cardiovascular properties, electromyography, electrodermal activity, thermography, oximetry and respiration. We will perform a tracking test as well as look at electronic issues.

1. *Day 2 Review Quiz*

30 minutes | Group responses to the day’s quiz

***Day 3 | Chris Gilbert / 8.5 hours***

1. *Evidence-based Research Methods in Applied Psychophysiology | Chris Gilbert*

8:00 – 10:00 | 2 hours | BCIA blueprint area IV

This section describes levels of research on biofeedback mechanisms and outcomes, from simple case studies to randomized controlled trials. The value for most will be in knowing better how to evaluate research claims and read published research with more knowledge of the terms and methods. The summary of biofeedback research sponsored by AAPB (clinical efficacy document) will be discussed with illustrations of certain relevant topics such as sham biofeedback

*Break 10:00 – 10:15 | .25 hours*

1. *EMG Theory: Muscle Anatomy and Physiology*

10:15 – 12:15 | 2 hours | BCIA blueprint area V

This section covers differences among muscle types (striated, smooth, cardiac); structure and function from sarcomere to motor unit to whole muscle; slow vs. fast twitch muscle differences; action potential, stretch reflex, alpha and gamma motor neurons; muscle coordination and synergy.

*Lunch 12:15 –1:15 | 1 hour*

1. *sEMG Electrode Placement Demonstration / Chris Gilbert*

1:15 – 3:15 | 2 hours | BCIA blueprint area V

Choosing muscles and electrode placements for tension-type headaches, TMJ disorders, neck and back pain, patello-femoral pain syndrome, postural correction, and worksite ergonomic  applications.

*Break 3:15- 3:30 | .25 hours*

1. *sEMG Practicum 1/2/ Chris Gilbert*

3:30 – 5:30 |2 hours | BCIA blueprint area V

Practical training based upon demonstrations; muscle training methods for TMJ, Tension-type headache, upper and lower back pain, and ergonomics.

1. *Day 3 Review Quiz*

30 minutes | Group responses to the day’s quiz

***Day 4 | Cynthia Kerson | 8.5 hours***

1. *ANS Modalities to Treat Pathophysiological Disorders*

8:00 – 10:00 | 1 hour | BCIA blueprint area VI

Migraine, Raynaud’s, hypertension, cardiac arrhythmias and hyperventilation syndrome are among the most common disorders treated by biofeedback. The section provides the best treatment plans based upon evidence-based research for each of them along with some others.

*Break 10:00 – 11:15 | .25 hour*

1. *Intervention Strategies with Biofeedback Part 1*

10:15 – 12:15 | 2 hours | BCIA blueprint areas VIII

Changes in cognitions, schemas, secondary gains, expectations, mid-treatment effects and family dynamics are some of the valuable markers for success or nonsuccess that the clinician should observe. Additionally, cognitive, nutritional and exercise retraining are excellent for restructuring negative behaviors that are easily added to the therapeutic program. This section will explore those that best contribute to clinical success based upon relevant research.

Lunch 12:15 – 1:15 | 1 hour

1. *Intervention Strategies with Biofeedback Part 2*

1:15 – 3:15 | 2 hours | BCIA blueprint area VIII

Continuation of above.

Break 3:15 – 3:30 | .25 hour

1. *Practicum, Demonstration and Discussion | Cynthia Kerson*

2:15 – 5:15 | 3 hours with 15-minute break | BCIA blueprint area VIII

This section will demonstrate intake protocols, showing typical measures and problem solving when there are hardware and/or software issues. It will then demonstrate relaxation and HRV strategies based upon the stress profile. A discussion will be lead about treatment options based upon the client’s presentation and goals. The attendees will break into groups at assess a “client” and formulate a treatment plan including all peripheral measures.

1. *Day 4 Review Quiz*

Group responses to the day’s quiz

***Day 5 | Cynthia Kerson | 8 hours***

1. *Professional Conduct*

8:00 – 10:00 | 2 hour | BCIA blueprint area IX

The Ethical Principles of Biofeedback consist of a set of guidelines agreed to by the BCIA, which outline the moral duty, obligation, or custom on how certificants should behave professionally. They should not be viewed as limiting the scope of ethical responsibility of BCIA certificants. Rather, they point out and underscore particular areas in which there is concern. These principles will be discussed.

*Break 10:00 – 10:15 | .25 hour*

1. *Autonomic (section 3 of 3) and Respiratory Strategies with Biofeedback*

10:15 – 2:15 | 3 hours with 1-hour lunch break | BCIA blueprint area VI

Respiratory arousal is very closely related to arousal of other autonomic functions. This section will provide demonstration and practical experience in uses for breath work with related heart rate, electrodermal and electromyographic training paradigms.

1. *Psychophysiological Recording Practicum*

2:15 – 5:15 | 3 hours | BCIA blueprint area VI

During this practical section, the attendee will practice any assessment or recording procedures that he or she has learned during this 5-day program.

1. *Day 5 Review Quiz*

30 minutes | Group responses to the day’s quiz