

# PSYC 321 Physiological Psychology Syllabus for Fall 2023

## Dr. Fred Shaffer

Buy or rent your book. Read it and take notes as you review each chapter to earn a C or better. Although our lectures, podcasts, and PowerPoints are valuable, they cannot replace reading Breedlove and Watson.

Come to class on time. *You may not take our daily quiz if you arrive more than 5 minutes late.* I will relax this policy for health and physics challenges and weather hazards. Contact me if you experience difficulties.

Despite risking agonizing withdrawal symptoms, set your phones aside during class. You are not wired for multitasking. What we call multitasking is really bad serial-tasking. Although few professors are as exciting as social media, your favorite app won't help you pass our class.

### OFFICE HOURS

My office hours are M-F 9:30-10:20 am in Barnett 2401 or by Zoom appointment.

### CHECKLIST

Log into [Brightspace](#) before our first class.

### BE PREPARED TO TAKE QUIZZES/EXAMS ONLINE

Set reminders to take our assignments from 1:10-1:20 am on the rare days we cannot physically meet.

### CLASS DESCRIPTION

**Format:** Our class will feature a review of the last quiz/exam, quiz learning objectives discussion, lecture, and a proctored quiz or an exam. Practice assignments do NOT count toward your grade.

**Academic integrity:** You may not use any resource or confer with anyone during an in-person quiz, exam, or Final. Your first violation of this policy will result in a score of 0 and a referral to the Provost. Your second violation will earn a semester grade of F and a Provost referral.

**How to prepare:** read assigned chapters, review the PPT, listen to a podcast lecture, use a Kahoot, and take a practice quiz.

**If you have or suspect you have COVID, RSV, or another virus:** follow Truman's testing and quarantine policies. Do NOT attend class. I will exempt your assignment.

**If you miss an assignment:** Quizzes and exams may not be reopened or taken online when our class meets in person.

## RESEARCH TEAM

If you have at least four Truman semesters left, I encourage you to join our Center for Applied Psychophysiology. We study how to teach people how to increase the healthy variability of their hearts. Your commitment would be to attend weekly Monday 5:30-6:00 pm meetings and a 2-hour shift. You may also enroll in PSYC 441 Research Practicum for 1 credit hour to receive academic credit on your transcript. We will teach you the skills you need to succeed. Apply if you are dependable, play well with others, and are willing to work hard.



## CATALOG DESCRIPTION

This course examines the philosophy of science and the application of the scientific method in physiological psychology, functional neuroanatomy, neurophysiology, the chemical bases of behavior, hormones and the brain, life-span development of the brain and behavior, regulation and behavior, emotions, and psychological disorders, and cognitive neuroscience. Prerequisite: Grade of C, or better, in PSYC 166 - General Psychology. Credits: 3.

## MY EXPECTATIONS

I expect you to succeed. Listen to every podcast and study 9 hours per week (135 hours per semester) for an A. College is a marathon that rewards discipline and consistent effort. We will strive together to create an environment that celebrates diversity, mutual respect, scholarship, and critical thinking.

## COMPLIANCE

Our class follows University policies concerning Academic Integrity, ADA Accommodations, Attendance, and Sexual Harassment. If you have an accommodation letter, please contact the Student Access Office (x4478) and me as soon as possible. See Appendix.

## TEXT

Our class requires Breedlove's Behavioral Neuroscience (10th ed.), Sinauer (publisher), You can't get by with an earlier edition. You will need it for the first day of class.

<b>Contact</b>	
<b>Email</b>	<a href="mailto:fredricshaffer@gmail.com">fredricshaffer@gmail.com</a> (place PSYC 266 in the subject line)
<b>Hours</b>	M-F 9:30-10:20 and by appointment on Zoom
<b>Support</b>	<b>ITS:</b> 660-785-4544 <b>Brightspace:</b> 660-785-4026
<b>My website</b>	<a href="http://fshaffer.sites.truman.edu/">http://fshaffer.sites.truman.edu/</a>
<b>Fast Course Facts</b>	
<b>Attendance</b>	In-person
<b>Quizzes</b>	Twenty-five 5-point objective question quizzes may not be rescheduled. Brightspace will silently drop your lowest quiz.
<b>Exams</b>	Five 50-question objective questions (50 points). They may not be rescheduled.
<b>Extra Credit</b>	20 points from all sources (SONA and 10-question Neuroscience of Depression Extra-Credit Exam).
<b>Comprehensive Final</b>	Required, with 100 objective questions (100 points).
<b>Text</b>	Breedlove and Watson's <i>Behavioral Neuroscience</i> (10th ed.)
<b>Resources</b>	
<b>Week in the 'ville</b>	Emailed to you
<b>Exams and Quizzes</b>	Quizzes
<b>Practice Tests</b>	Quizzes
<b>Syllabus, Exam Guides, PPTs, Podcasts, Kahoots</b>	Documents
<b>Videos</b>	External Links
<b>Truman Policies and Resources</b>	Syllabus Appendix
<b>Winning Study Strategies</b>	
Buy or rent our book. Read the entire chapter and take a practice quiz before each class. Practice quizzes and tests don't count toward your grade, and you may take them as often as you want	
Take notes on each chapter and then type them up and review them	
Review missed learning objectives, Guides, and Kahoots for exams, and Final	
Fill out the Exam Guides each week and study them for each exam	

### PHYSIOLOGICAL PSYCHOLOGY IS A LIBERAL ARTS AND SCIENCE COURSE

Following Phi Beta Kappa's description: "in acquiring a liberal education, the undergraduate will study primarily subjects which illuminate the human condition, subjects which explore aspects of taste and feeling, of the reasoning process, of the physical and moral worlds, of individual and group responsibility, of the meaning of life as a whole."

## KAIZEN

Our course utilizes *kaizen* (change + good) or continuous improvement. I evaluate previous question performance and rewrite/replace poorly performing items in building each semester's quizzes and exams. This review also helps me target learning objectives that require better explanation.



Kaizen

## COURSE OUTCOMES AND HOW WE WILL ACHIEVE THEM

Students who complete this course will understand the philosophy of science and the application of the scientific method in physiological psychology, functional neuroanatomy, neurophysiology, the chemical bases of behavior, hormones and the brain, life-span development of the brain and behavior, regulation and behavior, emotions and psychological disorders, and cognitive neuroscience. We will achieve these outcomes through lectures, frequent assessments, and participation in undergraduate research.

## BOTTOM LINE

I expect you to attend every in-person class session on time, read assigned textbook chapters, listen to the podcasts, and complete quizzes, exams, and our Final.

## GRADES

Your grade will be based on 475 points with no weighting:

25 quizzes (5 objective questions) = 5 points = 125 points

5 exams (50 objective questions) = 50 points = 250 points

comprehensive final (100 objective questions) = 100 points

To protect our question pool, you may only review quizzes and unit exams in class immediately after submitting your answers. You may not take notes from this review. Last, you may not review answers on your Final.

The grading scale is A = 90%, B = 80%, C = 70%, and D = 60%. I will round 89.5% to an A, while 89.4% will remain a B. Work hard and do extra credit to ensure the grade you want. There will be no opportunities to do extra work to raise your grade after the Final. Practice exams and quizzes do not count toward your grade.

## ONLINE ASSIGNMENTS

When class is online, you will only be able to take a quiz during our class time, and you will only receive a score.

## MISSED QUIZZES, UNIT EXAMS, AND FINAL

You may not reschedule quizzes, exams, or our Final (except for three finals on the same day).

## **UNIVERSITY-APPROVED EVENTS**

I will exempt up to 6 quizzes and 1 exam for absences for university-sponsored activities if you contact me in advance with documentation. An exemption means that the assignment will not count for or against you.

## **HEALTH CRISES**

I will exempt up to 6 quizzes and 1 exam for absences due to quarantine, medical appointments, and hospitalizations if you contact me in advance or immediately after a missed class. I will need documentation for missing 3 or more quizzes or an exam.

## **MISSED FINAL**

If you don't take your Final during its scheduled period for an excused reason, you may take it during one of my remaining Finals. If you miss your Final for an unexcused reason, I will assess a penalty of 25 points per day.

## **QUIZ OR EXAM QUESTION APPEAL**

Our textbook is authoritative, so always choose its authors' perspective if it disagrees with a practice question.

Review the relevant section of our textbook before challenging an answer and include the page number in your appeal. You must email me your concerns about a quiz or exam within 24 hours of its completion. After that time, I will not review your grade on that assignment.

## **EXTRA CREDIT**

You may earn a maximum of 20 points from participation in research on the SONA system and a 10-question extra-credit exam over the Neuroscience of Depression. I will enter SONA credit in a single column (SONA) by exam 4.

Nearly all classes in the Psychology department utilize an online system called SONA for participating in research conducted by our students and faculty members. Early in the semester, you will receive an email from SONA informing you of your unique UserID and Password and instructions and rules for using the system. You will use SONA to identify research opportunities in the department and then to volunteer for them. Credits earned in SONA can be applied as extra credit points in your PSYC classes. Note that all research participation is voluntary, all studies must pass ethical review before being posted on SONA. You may take the extra-credit exam instead if you'd rather not participate in research. Be sure to read each study's description before signing up, as some research is on topics that may make you uncomfortable. Up to 20 credits earned in SONA for our class can be used as extra credit.

## CALENDAR

<b>Fall 2023 Calendar for PSYC 321</b> <b>Assignments are due during class time and may not be extended or rescheduled.</b> <b>OL = online</b>		
<b>Week 1</b> Aug 22 Ch 2 (Q1) Aug 24 Ch 2 (Q2)	<b>Week 7</b> Oct 3 Ch 14 (Q11) Oct 5 Ch 14 (Q12)	<b>Week 13</b> Nov 14 Ch 16 (Q22) Nov 16 Ch 16 (Q23)
<b>Week 2</b> Aug 29 Ch 3 (Q3) Sept 31 Ch 3 (Q4)	<b>Week 8</b> <b>Oct 10 Exam 3 Ch 8 and 14, <u>Neuroscience: Sleep</u></b> Oct 12 Midterm Break	<b>Week 14</b> Nov 20-24 Thanksgiving
<b>Week 3</b> <b>Sept 5 Exam 1 Ch 2-3, <u>Neuroscience: Neurons</u></b> Sept 7 Ch 4 (Q5)	<b>Week 9</b> Oct 17 Ch 9 (Q13/Q14) Oct 19 Ch 10 (Q15)	<b>Week 15</b> Nov 28 Ch 18 (Q24) Nov 30 Ch 18 (Q25)
<b>Week 4</b> Sept 12 Ch 4 (Q6) Sept 14 Ch 5 (Q7)	<b>Week 10</b> Oct 24 Ch 10 (Q16) Oct 26 Ch 11 (Q17)	<b>Week 16</b> Dec 5 <u>Neuroscience: Consciousness</u> (Q26) <b>Dec 7 Exam 5 Ch 15-16, 18/EC over Chapter 17</b>
<b>Week 5</b> Sept 19 Ch 5 (Q8) <b>Sept 21 Exam 2 Ch 4-5, <u>Neuroscience: Addiction</u></b>	<b>Week 11</b> Oct 31 Ch 11 (Q18) <b>Nov 2 Exam 4 Ch 9-11, and <u>Neuroscience: Stress</u></b>	<b>Week 17</b> Dec 13 Reading Day <b>Dec 15 (Friday) Final 9:30-11:20</b>
<b>Week 6</b> Sept 26 Ch 8 (Q9) Sept 28 Ch 8 (Q10)	<b>Week 12</b> Nov 7 Ch 15 (Q20) Nov 9 Ch 15 (Q21)	Neuroscience posts are linked to the BioSource website

## APPENDIX: UNIVERSITY POLICIES AND RESOURCES

### Disability Services

To obtain disability-related academic accommodations, students with documented disabilities must contact the course instructor and the Office of Student Access and Disability Services (OSA) as soon as possible. Truman complies with ADA requirements. For additional information, refer to the Office of Student Access and Disability Services website at <http://disabilityservices.truman.edu/>. You may also contact OSA by phone at (660) 785-4478 or email [studentaccess@truman.edu](mailto:studentaccess@truman.edu)

### Emergency Procedures

In each classroom on campus, there is a poster of emergency procedures explaining best practices in the event of an active shooter/hostile intruder, fire, severe weather, bomb threat, power outage, and medical emergency. This poster is also available as a PDF at this link: <http://police.truman.edu/files/2015/12/Emergency-Procedures.pdf>.



Students should be aware of the classroom environment and note the exits for the room and building. For more detailed information about emergency procedures, please consult the Emergency Guide for Academic Buildings, available at the QR code shown or at the following link: <http://police.truman.edu/emergency-procedures/academic-buildings/>

This six-minute video provides some basic information on how to react in the event there is an active shooter in your location: <http://police.truman.edu/emergency-procedures/active-shooter/active-shooter-preparedness-video/>.

Truman students, faculty, and staff can sign up for the TruAlert emergency text messaging service via TruView. TruAlert sends a text message to all enrolled cell phones in the event of an emergency at the University. To register, sign in to TruView and click on the "Truman" tab. Click on the registration link in the lower right of the page under the "Update and View My Personal Information" channel on the "Update Emergency Text Messaging Information" link. During a campus emergency, information will also be posted on the TruAlert website <http://trualert.truman.edu/>.

## Discrimination and Title IX

Truman State University, in compliance with applicable laws and recognizing its deeper commitment to equity, diversity and inclusion which enhances accessibility and promotes excellence in all aspects of the Truman Experience, does not discriminate on the basis of age, color, disability, national origin, race, religion, retaliation, sex (including pregnancy), sexual orientation, or protected veteran status in its programs and activities, including employment, admissions, and educational programs and activities. Faculty and staff are considered “mandated reporters” and therefore are required to report potential violations of the University’s Anti-Discrimination Policies to the Institutional Compliance Officer.

Title IX prohibits sex harassment, sexual assault, intimate partner violence, stalking and retaliation. Truman State University encourages individuals who believe they may have been impacted by sexual or gender-based discrimination to consult with the Title IX Coordinator who is available to speak in depth about the resources and options. Faculty and staff are considered “mandated reporters” and therefore are required to report potential incidents of sexual misconduct that they become aware of to the Title IX Coordinator.

For more information on discrimination or Title IX, or to file a complaint contact:

Institutional Compliance Officer, Title IX, and Section 504 Coordinator  
Office of Institutional Compliance  
Violette Hall, Room 1308  
100 E. Normal Ave  
Kirksville, MO 63501  
Phone: (660) 785-4354  
[titleix@truman.edu](mailto:titleix@truman.edu)

The institution’s complaint procedure can be viewed at <http://titleix.truman.edu/files/2015/08/University-Complaint-Reporting-Resolution-Procedure.pdf> and the complaint form is accessible at <http://titleix.truman.edu/make-a-report/>.

**Statement regarding academic integrity/plagiarism policy** in accordance with the [University policy and procedures](#), for example: “ACADEMIC HONESTY – Personal and scholarly integrity are expected of everyone in the class. Failure to live up to those responsibilities, risks earning a failing grade on the assignment/examination, a failing grade for the course, and/or in serious cases expulsion for the academic program or University. The University policy on academic dishonesty as published in the Student Conduct Code and General/Graduate Catalog applies ([http://catalog.truman.edu/content.php?catoid=15&navoid=801#Academic Dishonesty](http://catalog.truman.edu/content.php?catoid=15&navoid=801#Academic_Dishonesty))



## **FERPA**

Education records are protected by the Family Education Right to Privacy Act (FERPA). As a result, course grades, assignments, advising records, etc., cannot be released to third parties without your permission. There are, however, several exceptions about which you should be aware. For example, education records can be disclosed to employees or offices at Truman who have an “educational need to know”. These employees and offices may include your academic advisor, the Institutional Compliance Officer, the Registrar's Office, or Student Affairs, depending on the type of information. For more information about FERPA, see <http://www.truman.edu/registrar/ferpa/>.

## **Statement on Disruptive Behavior**

“Behavior that persistently or flagrantly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students’ ability to learn and an instructor’s ability to teach. A student responsible for disruptive behavior may be asked to leave class pending discussion and resolution of the problem...” and may be reported to the Office of Citizenship and Community Standards. (*Quotation from Washington State University*).

## ABOUT DR. SHAFFER



I am a Professor of Psychology and have proudly taught at Truman since 1975. I served two terms as Psychology Department Convener and have supervised the Center for Applied Psychophysiology since 1976.



I earned a BA in Psychology and Political Science with a minor in Philosophy/Religion from Claremont Men's College in 1971.



I completed a MS in Clinical Psychology in 1973 and a PhD in Social-Personality Psychology in 1975 from Oklahoma State University.



In 2008, I received the **Walker and Doris Allen Fellowship for Faculty Excellence** at Truman State University.



In 2013, I received the **Outstanding Research Mentor of the Year** award at Truman for supervising the Center for Applied Psychophysiology since 1976. (Former Assistant Director Christopher Zerr is shown with his Order of Omega Leadership Award.)



In 2019, I received AAPB's **Distinguished Scientist Award** and was chosen as the Association for Applied Psychophysiology and Biofeedback (AAPB) President for 2022-2024. Dr. Inna Khazan, AAPB President-Elect, joined me for dinner at our 2023 conference.



Drs. Paul Lehrer and Don Moss also made our dinner a magical evening. Dr. Lehrer is one of the world's leading heart rate variability experts and a concert violinist. Dr. Moss is a world-class lecturer in biofeedback, hypnosis, and heart rate variability. We share the privilege of teaching with Dr. Khazan several times a year.



In April 2019, I attended the Biofeedback Federation of Europe conference in Cardiff, Wales. Above are Dr. Inna Khazan and Nick Gravett (Truman alumnus) at Caerphilly Castle, the largest in Wales. We stormed it.



I serve as the **Biofeedback Certification International Alliance's (BCIA)** Past-Chair and Secretary-Treasurer. BCIA created a perpetual Heart Rate Variability Biofeedback scholarship that waives certification fees in my name. This generous gift gives priority to Military applicants. [BCIA retreat in Golden, CO, June 2023.]

## Current Challenges

“He who isn't being born, is busy dying” – *Easy Rider*.

I spend my free time writing journal articles with my son Zachary. We are publishing our research team's most important studies.

Applied Psychophysiology and Biofeedback  
<https://doi.org/10.1007/s10484-022-09568-w>



## Adding Core Muscle Contraction to Wrist-Ankle Rhythmical Skeletal Muscle Tension Increases Respiratory Sinus Arrhythmia and Low-Frequency Power

Zachary M. Meehan<sup>1</sup> · Fred Shaffer<sup>2</sup>

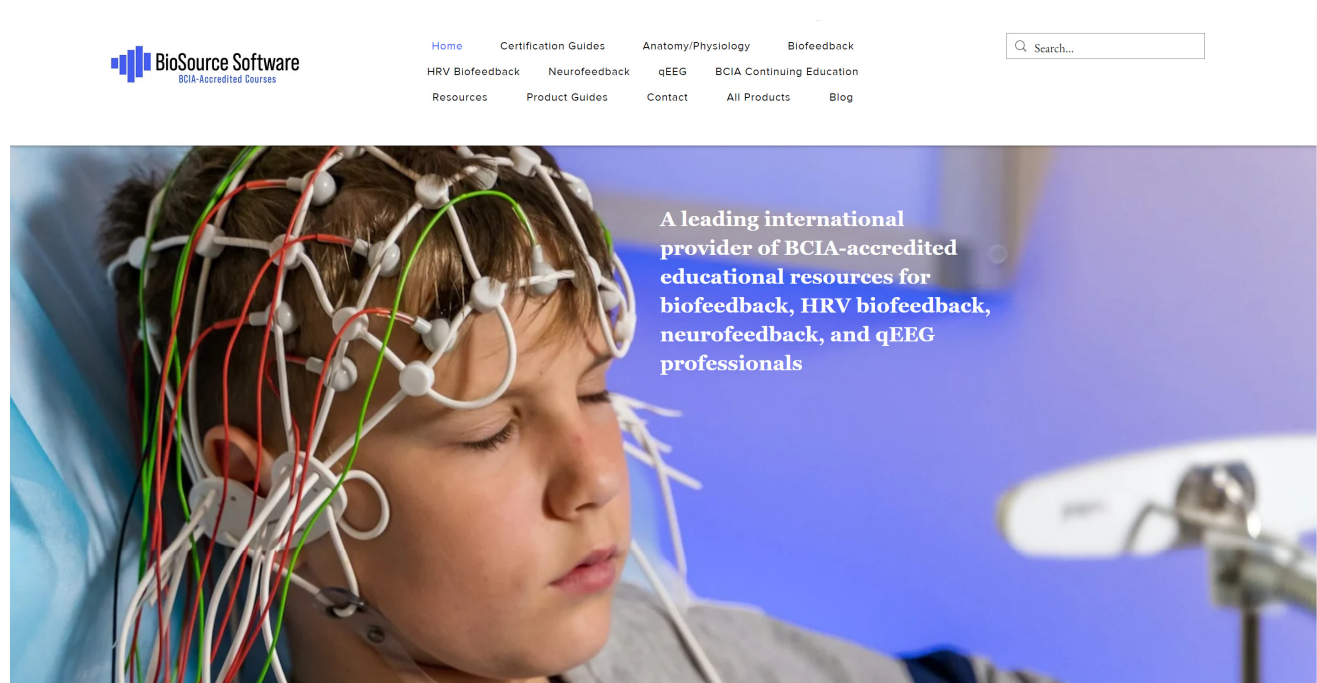
Accepted: 28 October 2022  
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### Abstract

Paced breathing and rhythmical skeletal muscle tension (RSMT) at an individual's resonance frequency [~6 breaths or contractions per min (cpm)] can stimulate the arterial and vascular tone baroreflexes. Lehrer (Appl Psychophysiol Biofeedback 1–10, 2022, <https://doi.org/10.1007/s10484-022-09535-5>) has explained that the stimulation rate is important, not the modality. Early RSMT protocols differed in the muscles recruited and whether legs were crossed or uncrossed (in France et al. Clin Physiol Funct Imaging 26: 21–25, 2006, <https://doi.org/10.1111/j.1475-097X.2005.00642.x>; Leher et al. Biol Psychol 81: 24–30, 2009, <https://doi.org/10.1016/j.biopsycho.2009.01.003>; Vaschillo et al. Psychophysiology, 48: 927–936, 2011, <https://doi.org/10.1111/j.1469-8986.2010.01156.x>). Whereas core muscle RSMT with crossed legs and wrist-ankle RSMT with uncrossed legs produced resonance effects, researchers have not directly compared the effect of these exercises on respiratory sinus arrhythmia (RSA) and low-frequency (LF) power. The current within-subjects experiment investigated whether crossing the legs and recruiting core muscles enhances wrist-ankle RSMT effects on RSA and LF power. We trained 35 participants to complete 6-cpm wrist-ankle RSMT (ankles uncrossed), 6-cpm wrist-core-ankle RSMT (ankles crossed), and a control condition in which participants sat quietly (ankles uncrossed) without performing RSMT. We predicted that 6-cpm wrist-core-ankle RSMT would produce greater heart rate (HR), HR Max-HR Min, and LF power than the other conditions. The experimental findings supported our predictions. Both RSMT conditions produced greater HR, HR Max-HR Min, and LF power than the control condition. Wrist-core-ankle yielded greater HR and HR Max-HR Min than wrist-ankle RSMT. Future research should compare wrist-ankle and wrist-core-ankle RSMT with legs crossed. The practical implication for HRV biofeedback training is that wrist-core-ankle RSMT with legs crossed may more powerfully stimulate the baroreflex than wrist-ankle RSMT with legs uncrossed.

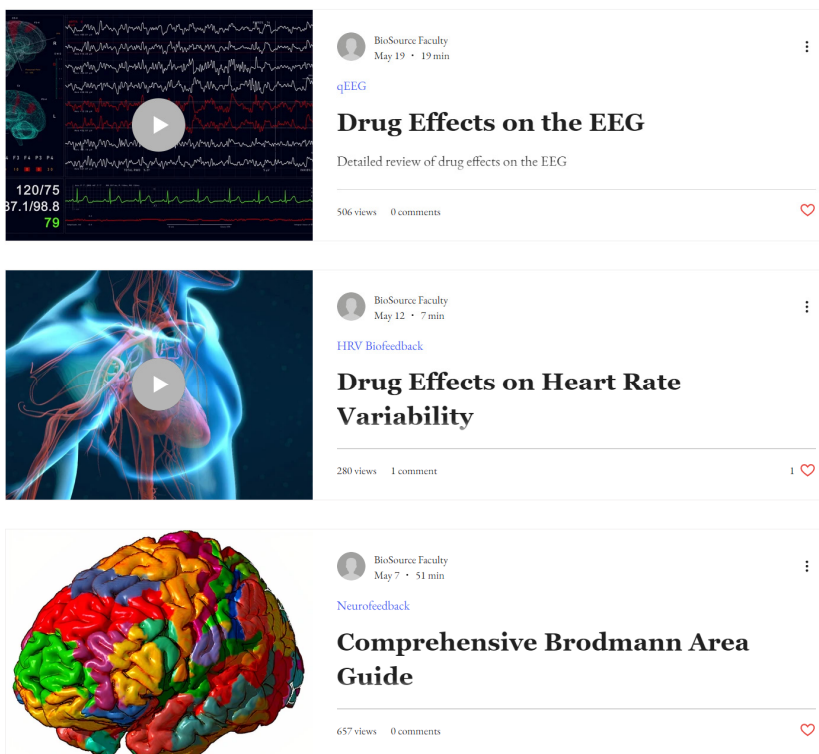
**Keywords** Physiological resonance · Cardiovascular system · Low-frequency power · Respiratory sinus arrhythmia · Rhythmical skeletal muscle tension · Heart rate variability

I have run [BioSource Software](#) since 1978. Last year, we worked with a professional web designer and search engine optimization company to build a world-class website. I am learning how to market our products, which is a safer bet than crypto.



BioSource is now the primary provider of HRV Biofeedback didactic training for the Veterans Administration. We will train 125 professionals from 2023-2024.

We publish weekly [educational posts](#) on Biofeedback, HRV Biofeedback, and Neurofeedback, which I develop or copy-edit.



## Travel



### Skeiða-og Gnúpverjahreppur

May 2019, I toured Reykjavík, Iceland with my son Zachary after graduating from the University of Northern Iowa with a Master's in Clinical Science. He is currently a Clinical Doctoral student at the University of Delaware.



### Mýrdalshreppur



Reynisfjara Beach



Golden, Colorado is one of my favorite places on the planet.