BSL
CATALOG

Biopac Student Lab

An integrated system of hardware, software and a lab manual that revolutionizes life science education

4-CHANNEL BSL SYSTEMS

2-CHANNEL BSL SYSTEMS

MP45

TRANSDUCERS & ACCESSORIES

www.biopac.com

BIOPAC STUDENT LAB FOR TEACHING

Integrated Hardware, Software & Curriculum

BIOPAC Systems, Inc.

"...these systems have successfully transformed the physiology laboratory"

EMPOWER YOUR STUDENTS WITH INTERACTIVE, MULTI-MEDIA LESSONS

- Students Record Live Physiological Data
- Focus on Key Principles
- Develop Real-World Skills
- Use Clinical & Standardized Techniques
- Extensive Experiment Range
- Instructor and Student Prep Tools
- Millions of Successful Lab Hours
- Proven to Increase Confidence & Proficiency

STUDENTS RECORD FROM THEIR OWN BODIES, ANIMALS, OR TISSUE PREPS

- Easy Setup...Great Data!
- Add Student-Designed Experiments
- Create Your Own Lessons
- Use Advanced Analysis

COMPLETE SYSTEMS FOR LIFE SCIENCE LABS

- Physiology
- Biology
- Psychophysiology
- Neuroscience
- Exercise Physiology & Biomechanics
- Pharmacology & Toxicology
- Biomedical Engineering
- Nursing

Used in thousands of labs worldwide! Incorporated in major published lab manuals!

V2

Give your students a proven advantage...give them BSL!

Biopac Student Lab continues to evolve with input from many thousands of existing users and physiology instructors. Check out demos and sample lessons online to see for yourself why BSL offers the most meaningful, flexible lab experience for students and teachers!

www.BIOPAC.com

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Registered to ISO 9001:2015

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Biopac Student Lab

Biopac Student Lab is a teaching solution that integrates hardware, software, and curriculum to revolutionize the way students learn physiology.

With simplified setup, higher quality data, and user-friendly measurement and analysis tools, students learn real-world skills using research compatible clinical techniques. Interactive, multi-media lessons help ensure great data recording and enable more students to record from their own bodies.
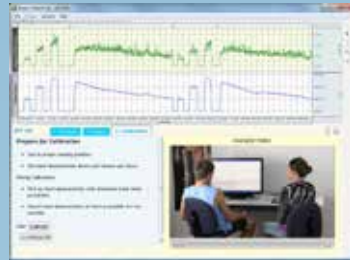
BSL Systems are configured for general life science or specific disciplines. Whatever the discipline, Biopac Student Lab is like having a teaching assistant at every station.

Free BSL Student software provides tools for lesson prep and data analysis outside of class so lab time can be focused on enabling more students to record data from their own bodies. Data can be printed, emailed, or sent to DropBox from within the BSL software so students can easily submit assignments or share and review group data.

"Students enjoy being able to analyze data that was generated from a member of their lab group. It certainly has more meaning to them than using traditional 'canned' lab data."

– Mary Truex, Indiana University South Bend, Biology Dept.

BSL Lessons are written by expert instructors, with each lesson demonstrating targeted physiological concepts. Lesson concepts and procedure are displayed in the software, and a BSL Lab Manual is included with each system. BSL Lessons are also included in major published Lab manuals. Use BSL *PRO* Lessons and features for advanced analysis, active learning, or graduate-level research. You can add the Curriculum Management System to display your own lesson content and prompts.

Request a demo today to find out why thousands of your colleagues choose BSL.

BSL System Level Solutions

The preferred solution for better science and greater discovery.

Choose Basic, Advanced, or Ultimate for general studies, or a discipline-specific system for animal, biology, BME, exercise phys, human phys, psychophys, or pharmacology/toxicology. Budget beating 2-channel systems also available to get you started—or build your own system!

- Hardware—Data acquisition unit, transducers & electrodes
- Software—Inquiry-based, hypothesis-driven lessons; Building-block structure for guided lessons to open-ended discovery
- Curriculum Library & Extensive support materials including videos and data samples
- Grant-friendly solutions—Recognized by NSF, NIH, and most major grant foundations
- Worldwide customer base—Thousands of users
- Advanced Programming Options—Application Programming Interfaces available to control MP36 hardware or access data files
- Multi-lingual support: English, Spanish, French, Chinese, Japanese, Russian, Italian

State-of-the-Art Technology

- Students learn real-world skills using clinical recording techniques
- Industry standard transducers—Over 60 currently available
- Gas analysis module for CO_2 and O_2 measurements
- Stimulus generation functionality
- Digital control channels—8 Input/8 Output
- Visual presentation options—SuperLab, E-Prime, MediaLab, DirectRT, Inquisit
- Tissue bath stations—Modular systems, heating circulators
- Support for the latest operating systems
- Interface with all major amplifier and transducer manufacturers —use ready-made connectors or a custom kit
- Continuous product development

Contact BIOPAC to discuss which BSL Systems work best for your students, your lab!

Biopac Student Lab Systems

Simplify your labs & empower your students

BSL Systems help students focus on scientific principles and record the highest quality data!

- User-friendly, intuitive interface delivers unmatched guidance, power, and flexibility
- Extensive support materials to prepare for lab time, including videos & sample data files
- Adaptable lessons—follow the lesson tasks or assign new tasks to suit your course requirements—plus, students can easily design experiments to develop and test their own hypothesis
- Embed PDFs in PRO graph templates—students can easily view in the online Journal and follow your custom lessons or their own experiment
- Sophisticated measurement tools help students extract—and easily report—meaningful data.
- Compare baseline and experimental response values to normative values
- View data in a variety of industry-standard formats: X/Y, overlap, clinical grids, chart recorder, oscilloscope, standard curve, etc.
- Professional data reports— automatically paste screen shots into lab reports and measurement values into statistical programs, or create high-quality printouts with clinical grids, markers, and full color
- Autosave feature for lessons—includes student's name and lesson number and allows instructors to set file storage location

BSL Systems

Systems include MP36 or MP45 data acquisition unit, Biopac Student Lab software and Lab Manual, plus targeted transducers to perform discipline-specific lessons.

Choose an existing system or start with the Basic and build your own!

Lessons introduce human physiology concepts: muscular, cardiovascular, neurophysiology, and pulmonary function, plus bioengineering.

Basic	*perform 19+ lessons*
Advanced	*perform 33+ lessons*
Ultimate	*perform 43+ lessons*

Review objectives and lesson details online.

Human Physiology *Perform 25+ lessons*

Use the power of the BSL System to conduct the most widely studied responses in physiology labs and perform analysis online or off. Lessons target the circulatory system, respiratory system, muscular function, brain function, ANS, exercise physiology and neurophysiology. Dynamic experiments with students as subjects increase interest and retention and develop critical thinking. Basic lessons guide and prompt students—promote hypothesis-driven student inquiry with advanced options or develop user defined lessons and research projects.
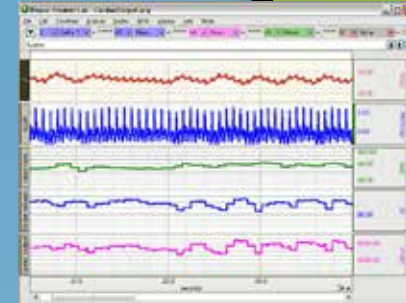
Animal *Perform 30+ lessons*

Provides a wide range of options for animal and tissue experiments, plus intro human physiology. Lessons allow students to study animal and human species for comparative physiology programs. Use the new Gas Analysis Module for human and animal experiments for the analysis of expired O_2 and CO_2. The Dissolved Oxygen probe allows students to monitor the oxygen consumption of a goldfish. Perform intracellular recording and membrane transport studies.
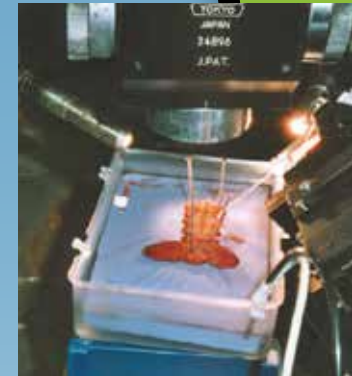
Biology *Perform 50+ lessons*

Record signals from cells, organs, insects, animals and human subjects to facilitate a spectrum of application opportunities. The system has options for pH and dissolved oxygen. A wide range of lessons covers the cardiovascular, immune, respiratory, pulmonary, metabolic, digestive and nervous systems. User-friendly recording options and analysis tools promote student inquiry and active learning. Employ new software options to develop new lessons specifically tailored to unique course material.
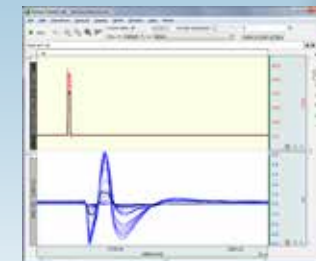
Exercise *Perform 33+ lessons*

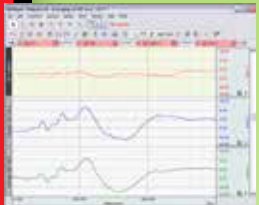Combine a wide range of respiratory system & pulmonary function signals with biomechanical data. Use the new Gas Analysis Module for online analysis of expired O_2 and CO_2 levels. Simultaneously record continuous, noninvasive blood pressure and cardiac output (bioimpedance method). BIOPAC offers transducers for angle of limb movement, acceleration, heel-toe strike, etc. for gait analysis, range of motion and other related studies. The system easily interfaces with force plates, motion analysis equipment and other instrumentation.
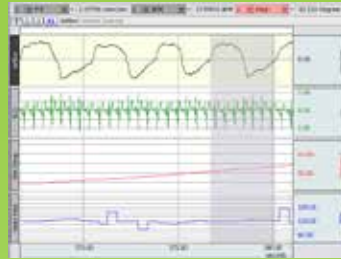
### Psychophys & Neurophys *Perform 31+ lessons*

Present a wide array of psychophysiology experimental techniques with the BSL System. Lessons guide students through recording and analysis modalities to provide building blocks that empower students to perform increasingly advanced studies. Acquire signals for ECG, EDA (GSR), EEG, EMG, EOG and EGG. Combine physiological data with trigger information time synced with advanced stimulus presentation paradigms. Record noninvasive cardiac output and blood pressure while students perform tasks or respond to a presentation.

Pharm & Tox *Perform 27+ lessons*

This BSL System combines a range of experiment options for cardiovascular hemodynamics, respiratory system & pulmonary function, in vitro tissue and cellular studies. The range of tissue bath stations provides an extra level of functionality for in vitro tissue experiments. Powerful, real-time analysis functions for pressure recordings include systolic, diastolic, mean BP, and dP/dt max and min. Similar tools are available for smooth muscle experiments, including peak, area, and derivative measurements. Add the noninvasive Cardiac Output Sensor to record stroke volume and cardiac output.
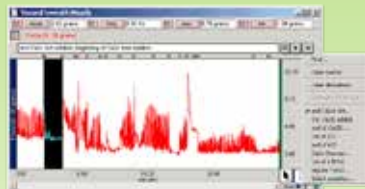
BME *Perform 38+ lessons*

The BSL System provides extensive recording and analysis options for signal processing curriculum, including bioelectric and biomechanical studies. The data acquisition unit includes four universal, software-programmable amplifiers to record biopotential and transducer signals. The BSL hardware/software combination can be tailored for a wide range of measurements with analysis tools for digital filtering, integration, differentiation, FFT, convolution, correlation, and a host of signal processing options. Students build and test real circuits and then use the software to compare real results to simulation.
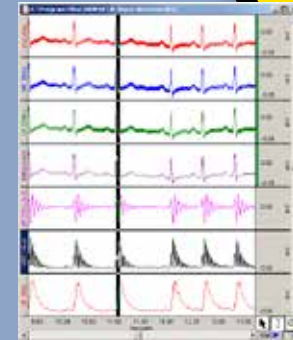
Budget-beating two-channel MP45 systems
Cost-effective, introductory life science teaching solutions

Intro System *Perform 19+ lessons*

BSL System with MP45 (2CH) and hardware for 6 guided lessons plus student-designed life science experiments. This system is a great way to add a physiology component to other programs— psychology, biomedical engineering, etc.
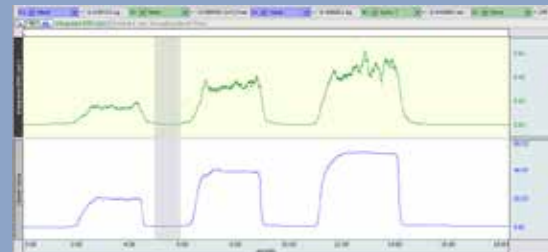
Health Sciences System *Perform 26+ lessons*

BSL System with MP45 (2 CH) hardware for 11 guided lessons plus student-designed life science experiments. This BSL System is ideal solution for nursing and health science programs.

BSL HARDWARE

DATA ACQUISITION UNITS
Power & Flexibility

MP36   **MP45**

Powerful MP36 Data Acquisition Unit provides four certified human-safe input channels, built-in amplifiers, built in stimulator, and output options—with a 5-year warranty.

The MP45 provides two channels of input and offers a great option for programs with a limited budget or programs that know the value of adding a physiology component to other disciplines.

Use with BSL System components or choose transducers, stimulators, electrodes, and accessories á la carte to create a customized system.

LEAD SET

Shielded Lead Set **SS2LB**
General-purpose electrode lead set—two per BSL System, except Animal and Pharma substitute BSLCBL8
Use for high-resolution recording of biopotentials. Cable terminates in standard pinch connectors to use with disposable EL500 series snap electrodes.

STIMULATION

MP36 Built-in Stimulator Adapter **OUT3**
The MP36 includes a built-in low voltage stimulator that is accessed via the Analog Out port with OUT3. The OUT3 female BNC adapter outputs signals and supports easy connection to nerve chambers, stim electrodes, clip leads, and more.

Human-safe Stimulation Electrodes
Handheld probes deliver superior safety & comfort Control stimulus delivery by pressing or releasing red safety switch.

STMHUM Direct to MP36: Eliminates the need for an external stimulator! Pulse output 0-100 V, with pulse width 50 μsec to 1 msec—hardware limited to ensure safety.

HSTM01 Interface via BSLSTMB: Great add-on for labs that already have Voltage Stimulator BSLSTMB or may need one for animal studies. Max Pulse Width: 1000 μsec, Min Pulse Width: 100 μsec.

Biopac Student Lab Stimulator **BSLSTMB**
Pulse output stimulator, powered by the MP36, voltage range 0-100 V. Range and Level are manually controlled; pulse timing is user-adjustable and controlled by the BSL software.

ELECTRODES — DISPOSABLE & REUSABLE

Acquire accurate physiological signals that help ensure a rewarding classroom experience. BIOPAC's range of disposable and reusable electrodes, electrode leads, and accessories support a wide variety of applications.

General-purpose recording **EL503**

Cloth electrodes — great for facial EMG **EL500**

Needle electrodes for recording and stimulating animal or tissue preps

EL452   ELSTM2

EDA recording (pre-gelled with isotonic gel) **EL507**

Fixed-spacing electrode pairs **EL504**

EDA (GSR) Transducer SS3LA

Measure electrodermal activity and response (galvanic conductance/GSR). The built-in, reusable electrodes fit on fingertips or can be taped to any other body part.

Pulse Photoplethysmogram SS4LA

Measure blood density changes in the fingertip or other body locations, caused by varying blood pressure. Record the pulse pressure waveform.

Respiratory Effort Transducer SS5LB

The unobtrusive transducer measures change in thoracic or abdominal circumference. Presents minimal resistance to movement and can measure extremely slow respiration patterns.

Fast-response Thermistor SS6L

Measure small variations in temperature, on the skin surface or in an air stream. Record changes in airflow during breathing to indicate respiration rate.

Hand Switch SS10L

Momentary push-button for remote event marking or for psychophysiological response tests. Monitor switch data as an input channel.

Airflow Transducer (Med.Flow) SS11LB

Medium flow pneumotach for resting & light exercise. Perform a variety of tests relating to airflow and lung volume; integrate the airflow signal to obtain volume measurements. The pneumotach has a clear, removable head for sterilization.

Variable Range Force Transducer SS12LA

Use for tissue bath and isolated organ experiments, frog gastrocnemius and human finger twitch experiments. Operates in five ranges (50 g, 100 g, 200 g, 500 g or 1,000 g).

Blood Pressure Cuff Transducers SS19LB/L

SS19LB for MP36   SS19L for MP45

Measure blood pressure via oscillometric or auscultatory methods. Use with the SS30L to record BP and Korotkoff sounds. Includes adult cuff (RX120D), pump bulb, and pressure sensor.

Goniometers & Torsiometers SS20L-SS24L

Measure bending strain along or around a particular axis to transform angular position into a proportional electrical signal.

Hand Dynamometer SS25LB

Use in isolation to measure grip force or combine with EMG recordings for in-depth studies of muscular activity. Lightweight, ergonomically designed transducer provides direct readings in kg or lbs.

Multi-Lead ECG SS29L

Use with standard snap-connector disposable electrodes (EL500 series) to simultaneously record Leads I, II, III, aVR, aVL, aVF, plus one alternating precordial chest lead V(1-6) for 12-lead studies.

Electronic Stethoscope Transducer SS30L

Standard clinical stethoscope with built-in electronic microphone to simultaneously capture sound. Listen to heart sounds and Korotkoff sounds, and simultaneously record the sound data. When recording ECG, correlate timing of the heart sounds with the cardiac cycle.

Noninvasive Cardiac Output SS31LA

Simultaneously measure Impedance Magnitude (Z(t)) and Derivative of Impedance Magnitude (dZ/dt). Use to determine Stroke Volume and Cardiac Output. Includes 8 leads for use with spot electrodes.

Reflex Hammer Transducer SS36L
Classic reflex hammer with a transducer attached to perform reflex measurements and record the time and relative strength of the strike.

Signal Processing Breadboard SS39L
Bioengineering Breadboard circuitry hardware and design notes for a subset of circuit design for recording and processing physiological signals.

EDA Lead Set for Disposable Setups SS57LA
The SS57LA EDA Lead Transducer snaps to two disposable EDA (isotonic gel) electrodes.

Finger Twitch Transducer SS61L
Record finger twitch responses from human subjects receiving electrical stimulation. Transducer conforms to the shape of the finger.

Dissolved O2 Probe SS69L
Measure dissolved oxygen levels. Includes electrolyte solution, replacement membrane cap and replacement O-ring.

Gas Analysis Module GASSYS3
Pair the Gas Analysis System with the MP36 Unit + SS11LB airlfow transducer for quality metabolic data: VO_2, VCO_2, RER, EE, REE, and RMR from Subjects at rest or during exercise. Integrates O_2, CO_2, humidity, temp, and barometric sensors.

Nerve Conduction Chambers NERVE 1/2
Acrylic chamber has 15 stainless steel pins with 5 mm spacing for recording and stimulating nerve preparations. Sockets accept 2 mm plugs, including BIOPAC stim and recording cables. Optional lid.

Stroboscope TSD122C
The stroboscope connects directly to the MP36 Input or Output channels for visual evoked response applications.
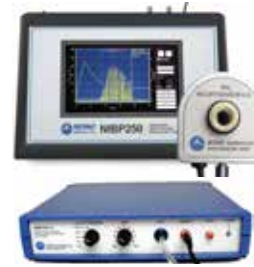
Noninvasive Blood Pressure Systems
NIBP Amplifiers with built-in pump automatically inflate the tail cuff to occlude the vessel in the tail of a rat or similar small animal, and then slowly deflate the cuff when the inflation point is reached

NIBP250 Stand Alone or with MP36
Touchscreen LCD controls & displays data for local analysis and storage or interface to MP36 or third-party A/D hardware.

NIBP200A Use with MP36
Amplifier for use with Tail Cuff Sensor.

Tissue Bath Stations TISSUEBATH1/2/4/8
Modular stations include glassware (tissue bath and warming coil), tubing, reservoir, tissue hooks and mounting accessories, plus force transducer and micrometer tension adjuster. Unique design makes mounting of the tissue prep very easy and makes it easy to add or remove stations.

Tubephone OUT101
Use with a stimulator module to deliver clicks in auditory evoked response applications (i.e., ABR). Monaural acoustic transducer with soft tip to fit in ear.

Headphones
Use headphones to listen to real-time physiological signals (like EMG), or to present auditory stimuli.

OUT1A Ultra-wide frequency response headphones. Connect to headphone port on MP36 only.

40HP Monaural headphones. Connect to headphone port. Ships with MP45 BSLHScS Systems.

Stimulus Presentation & Marking Systems
Deliver, measure and mark responses to a variety of stimuli—auditory, visual, electric, olfactory, haptic, electric. Software, hardware, and integrated systems available for SuperLab and E-Prime. Interfaces to other systems available.

BSL LESSONS

BSL Laboratory Manual

Electromyography (EMG)
L01 Standard & Integrated EMG
L02 Motor Unit Recruitment & Fatigue

Electroencephalography (EEG)
L03 Relaxation & Brain Rhythms
L04 Alpha Rhythms in the Occipital Lobe

Electrocardiography (ECG)
L05 Components of the ECG
L06 Bipolar Leads (Leads I, II, III),
     Einthoven's Law, Mean Electrical
     Axis on the Frontal Plane

ECG & Pulse
L07 Mechanical Action of the Heart,
     Peripheral Pressure Pulse,
     Plethysmography

Respiratory Cycle
L08 Respiratory Rates, Depth of Breathing,
     Regulation of Ventilation

EDA & Polygraph
L09 Electrodermal Activity & the Polygraph

Electrooculogram (EOG)
L10 Eye Movement; Saccades & Fixation During Reading

Reaction Time (Fixed-interval and Pseudo-random Presentation)
L11 Auditory / L11A Visual Reaction Time & Learning

Pulmonary Function
L12 Volumes & Capacities
L13 Pulmonary Flow Rates ($FEV_{1,2,3}$ and MVV)

Biofeedback
L14 Relaxation & Arousal

Aerobic Exercise Physiology
L15   Cardiovascular & Respiratory Adjustments During and After Exercise

Blood Pressure
L16 Indirect BP Measurement, Ventricular Systole & Diastole, Korotkoff sounds, Mean
     Arterial Pressure

Heart Sounds
L17   Cardiac valve functions, Electrical & Mechanical Events

Spinal Cord Reflexes
L20 Latent periods & reaction times; Contractile force vs. stimulus strength; Jendrassik
     maneuver influence; Voluntary vs. involuntary activation of skeletal muscle

FREE BSL Student Download includes Lab Manual content

- Prepare for the lab–read the physiology intro, review the procedure, watch videos, see data
- Analyze data–open files and follow the analysis guide, complete the report
- Share results–send report & data to instructor or classmates

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BSL *PRO* LESSONS

Inquiry-based hypothesis-driven lesson guides & recording templates for active learning and advanced studies

Review lesson objectives, tasks, and key features at https://www.biopac.com/curriculum

Animal Studies

A01 Frog Prep, **A02** Frog Gastrocnemius, **A03** Frog Sciatic Nerve, **A04** Frog Heart – Cardiac Rate & Contractility, **A05** Visceral Smooth Muscle (rabbit ileum), **A06** Cockroach Ventral Nerve AP, **A07** Fish Respiration & Q10, **A08** Earthworm Action Potential, **A09** Cardiac Muscle (Turtle Heart), **A11** Resting Potential–Crayfish Muscle using Crawdad Lab Manual, **A14** CPG Hornworm, **A15** Earthworm Smooth Muscle, **A17** Frog Heart Intracellular Action Potentials

BME - Biomedical Engineering

H02 Compartmental Modeling, **H20** Filtering: Design and develop software-based digital filters and cascade 2nd-order biquads, **H25-26 (8 lab series)** Schematics & design notes to build Active Filters, Sine Wave Generator, Logarithmic Amplifier, and Absolute Value Converter and ECG R-wave detector, **H33** FFT Fast Fourier

Cardiovascular

H01 12-Lead ECG **H08** Dive Reflex, **H21** Impedance Cardiography (Cardiac Output & Stroke Vol.), **H23** Signal Averaging ECG

Exercise Physiology

H04 Blood Pressure, **H05** WAnT Wingate Test, **H17** Biomechanics, **H18** Exercise Phys. BP, **H35** ROM/Sit & Reach, **H36** Muscular Biofeedback

Muscular

H06 Finger Twitch, **H07** EMG | Skeletal Muscle – Active Learning, **H27** Facial EMG, **H34** Electrogastrogram (EGG)

Neurophysiology

H03 Nerve Conduction, **H09** Auditory Evoked Potential, **H10** Hemispheric EEG, **H11** Mirror Test: Sensory-Motor Learning & EDA, **H12** EOG Saccades, **H13** EOG Tracking, **H14** Fixation (3-lead), **H15** Fixation (6-lead), **H16** Reflexes & Reaction Time, **H22** Visual Evoked Response (P100 test), **H24** Habituation EDR & Heart Rate response to repeated stimulus **H28** Reflex Response & angular movement, **H30** Stroop Effect, **H31** Prepulse Inhibition—startle, **H32** Heart Rate Variability—statistical measures, geometric measures, and spectral analysis

Respiratory & Pulmonary Function

H19 VO2 & RER, **H29** V̇O2 to calculate Metabolic Rate

curriculum & tutorial videos online

www.BIOPAC.com

lesson hardware guide using Core Package hardware

using Core Package hardware

#	Lesson	Required (Optional)	Basic	Advanced	Ultimate	Human	Animal	Biology	Psych	Ex. Phys.	BME	Pharm.	Intro MP45	HSCS MP45
BSL1	EMG I	SS2LB (OUT1A/40HP)	x	x	x	x	x	x	x	x	x	x	x	x
BSL2	EMG II	SS2LB, SS25LB or 56L (OUT1A/40HP)			x	x		x		x	x			x
BSL3	EEG I	SS2LB	x	x	x	x	x	x	x	x	x	x	x	x
BSL4	EEG II	SS2LB	x	x	x	x	x	x	x	x	x	x	x	x
BSL5	ECG I	SS2LB	x	x	x	x	x	x	x	x	x	x	x	x
BSL6	ECG II	SS2LB x2	x	x	x	x	x	x	x	x	x	x	x	x
BSL7	ECG & Pulse	SS2LB, SS4LA			x	x		x	x	x	x			
BSL8	Respiratory Cycle	SS5LB, SS6L			x	x		x		x				
BSL9	EDA & Polygraph	SS2LB, SS5LB, SS57LA (SS4LA)			x	x		x	x					
BSL10	Electrooculogram (EOG)	SS2LB x2	x	x	x	x	x	x	x	x	x	x	x	x
BSL11	Reaction Time Auditory	SS10L, OUT1A			x	x		x	x	x	x			
BSL11A	Reaction Time Visual	SS10L, OUT4												
BSL12	Pulmonary Function I	SS11LB (AFT27)			x	x	x	x		x	x	x		x
BSL13	Pulmonary Function II	SS11LB (AFT27)			x	x	x	x		x	x	x		x
BSL14	Biofeedback	SS2LB, SS57LA			x	x		x	x					
BSL15	Aerobic Exercise Physiology	SS2LB, SS6L, SS11LB (AFT27)			x	x		x		x				
BSL16	Systemic Blood Pressure	SS2LB for MP36, SS19LB, SS30L				x	x	x	x	x	x			x[1]
BSL17	Heart Sounds	SS2LB, SS30L				x	x	x	x	x	x			x
BSL20	Reflex Response (patellar tendon)	SS36L, SS2LB (SS20L or SS21L)						x						
H01	12-Lead ECG	SS29L			x			x						
H02	BME Compartmental Modeling	SS2LB		x	x			x	x	x	x			
H03	Nerve Conduction Velocity	SS2LB, STMHUM (BSLSTM+HSTM01)			x			x						
H04	BP Response to Straining Exercise	SS19LB, SS30L				x	x	x		x	x	x		
H05	Wingate Test (WAnT)	SS73L												
H06	Finger Twitch	SS61L, STMHUM (BSLSTM+HSTM01)				x		x						
H07	EMG - Active Learning	SS2LB	x	x	x	x	x	x	x	x	x	x	x	x
H08	ECG Dive Reflex	SS2LB	x	x	x	x	x	x	x	x	x	x	x	x
H09	Auditory Evoked Potential (AEP)	BSLSTMB, OUT101, BSLCBL6												
H10	Hemispheric EEG	SS2LB x2	x	x	x	x	x	x	x	x	x	x	x	x
H11	Mirror Test: Sensory Motor & EDA	SS10L, SS57LA		x	x				x	x				
H12	Saccades: EOG	SS2LB	x	x	x	x	x	x	x	x	x	x	x	x
H13	Tracking: EOG	SS2LB	x	x	x	x	x	x	x	x	x	x	x	x
H14	Fixation I: EOG (3-lead)	SS2LB	x	x	x	x	x	x	x	x	x	x	x	x
H15	Fixation II: EOG (6-lead)	SS2LB x2	x	x	x	x	x	x	x	x	x	x	x	x
H16	Reflexes & Reaction Time	SS10L, OUT1A			x	x		x	x	x	x			
H17	Biomechanics	SS2LB x2, SS21L												
H18	Exercise: Contin Noninvasive BP	NIBP100A												
H19	VO2 & RER	SS11LB, GASSYS3 + accessories												
H20	BME Filtering	No transducer required	x	x	x	x	x	x	x	x	x	x	x	x
H21	Impedance Cardiography (CO)	SS2LB, SS31LA												
H22	Visual Evoked Response (VER)	SS2LB, TSD122C												
H23	Signal Averaged ECG	SS2LB	x	x	x	x	x	x	x	x	x	x	x	x
H24	Habituation	SS2LB, SS10L, SS57LA			x	x			x	x				
H25	BME Signal Processing: 8 Circuits	SS39L + included SS60LA									x			
H26	BME Signal Processing: Detector	SS39L + included SS60LA									x			
H27	Facial EMG	SS2L x2 (SS10L)	x	x	x	x	x	x	x	x	x	x	x	x
H28	Reflex Response (patellar tendon)	SS2LB, SS36L (SS21L)												
H29	VO2 & RER	SS11LB, GASSYS3 + accessories												
H30	Stroop Effect	SS10L, STP35W												
H31	Prepulse Inhibition	SS2LB, STP35W (OUT100)												
H32	Heart Rate Variability Analysis	SS2LB	x	x	x	x	x	x	x	x	x	x	x	x
H33	BME FFT Fast Fourier Transform	no transducers required	x	x	x	x	x	x	x	x	x	x	x	x
H34	EGG human (stomach)	SS2LB	x	x	x	x	x	x	x	x	x	x	x	x
H35	Range of Motion: Sit & Reach	SS21L												
H36	Muscular Biofeedback (aud, vis, touch)	SS2LB (OUT1A/40HP)			x	x		x	x	x	x			x
A01	Frog Pith & Prep	no transducers required	x	x	x	x	x	x	x	x	x	x		
A02	Frog Gastrocnemius	OUT3, ELSTM2, SS12LA					x	x				x		
A03	Frog Sciatic Nerve	OUT3, NERVE1/2, BSLCBL2A+4B					x	x				x		
A04	Frog Heart	SS12LA (HDW100A or HDW200)				x	x	x				x		
A05	Visceral Smooth Muscle	SS12LA (HDW100A/200, TISSUEBATH)			x*		x*	x*				x*		
A06	Cockroach Ventral Nerve	BSLCBL8/9, EL452 x3					x	x				x		
A07	Q10 Principle (Dissolved O2-Goldfish)	SS69L or BSL-TCI16					x*	x*						
A08	Action Potential in Earthworm	OUT3, NERVE1/2, BSLCBL2A+4B					x	x			x			
A11	Resting Potential–Crayfish Muscle	BSLCBL8 (CBL204 x2)					x†	x†				x†		
A14	Central Pattern Generator (hornworm)	BSLCBL8, EL452 x3					x	x			x			
A15	Earthworm Smooth Muscle	SS12LA (HDW100A/200, TISSUEBATH)			x		x	x				x		
A17	Frog Heart Intracellular Act Potent˙	SS9LA + microelec amp + bath												

[1]no ECG +basic tissue bath required *interface included, probe required †requires Crawdad CD-ROM Lab Manual ˙glass microelectrode required

- Ready-to-run, ready-to-teach right out of the box
- Fully engages students before, during, and after the lab
- Customizable, scalable, and flexible for advanced and upper-level coursework