

# Lesson hardware guide

## using Core Package hardware

|  | Page | Basic | Adv. | Ult. | Human | Animal | Biology | Psych | Ex. Phys. | BME | Pharm. | Hardware Used (optional)                     |
|--|------|-------|------|------|-------|--------|---------|-------|-----------|-----|--------|--|
| BSL1: EMG I  | 43   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L p25, (OUT1 p26)                         |
| BSL2: EMG II   | 43   |       |      | x    | x     |        | x       |       | x         | x   |        | SS2L p25, SS25LA p27, (OUT1 p26)             |
| BSL3: EEG I  | 43   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L p25                                     |
| BSL4: EEG II   | 43   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L p25                                     |
| BSL5: ECG I  | 43   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L p25                                     |
| BSL6: ECG II   | 43   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L x2 p25                                  |
| BSL7: ECG & Pulse  | 43   |       | x    | x    |       |        | x       | x     | x         | x   |        | SS2L p25, SS4LA p26                          |
| BSL8: Respiratory Cycle I  | 43   |       | x    | x    |       |        | x       |       | x         |     |        | SS5LB and SS6L p26                           |
| BSL9: GSR & Polygraph  | 44   |       | x    | x    |       |        | x       | x     |           |     |        | SS2L p25, SS5LB and SS57L p26                |
| BSL10: Electrooculogram (EOG) I                                    | 44   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L x2 p25                                  |
| BSL11: Reaction Time I   | 44   |       | x    | x    |       |        | x       | x     | x         | x   |        | SS10L and OUT1 p26                           |
| BSL12: Pulmonary Function I  | 43   |       | x    | x    | x     |        | x       |       | x         | x   | x      | SS11LA p27, AFT6 p34                         |
| BSL13: Pulmonary Function II                                       | 43   |       | x    | x    | x     |        | x       |       | x         | x   | x      | SS11LA p27, AFT6 p34                         |
| BSL14: Biofeedback   | 44   |       | x    | x    |       |        | x       | x     |           |     |        | SS2L p25, SS57L p26                          |
| BSL15: Aerobic Exercise Physiology                                 | 44   |       | x    | x    |       |        | x       |       | x         |     |        | SS2L p25, SS6L p26, SS11LA p27               |
| BSL16: Systemic Blood Pressure                                     | 43   |       |      | x    | x     |        | x       | x     | x         | x   |        | SS2L p25, SS19L p27, SS30L p28               |
| BSL17: Heart Sounds  | 43   |       |      | x    | x     |        | x       | x     | x         | x   |        | SS2L p25, SS30L p28                          |
| BSL18: Metabolic Rate  | 43   |       |      |      |       |        |         |       |           |     |        | SS11LA p27, GASSYS2 and AFT6 p34             |
| H01 12-Lead ECG  | 45   |       |      | x    |       |        | x       |       |           |     |        | SS29L p27                                    |
| H02 BME Compartmental Modeling                                     | 44   |       | x    | x    |       |        | x       | x     | x         | x   |        | SS2L p25                                     |
| H03 Nerve Conduction Velocity                                      | 44   |       |      | x    |       |        | x       |       |           |     |        | SS2L p25, BSLSTM p25, HSTM01 p28             |
| H04 Blood Pressure Response to Straining Exercise                  | 44   |       |      | x    | x     |        | x       |       | x         |     |        | SS19L p27, SS30L p28                         |
| H05 Wingate Test (WAnT)  | 43   |       | x    | x    |       |        | x       |       | x         |     |        | SS4LA p26                                    |
| H06 Finger Twitch  | 43   |       |      | x    |       |        | x       |       |           |     |        | SS61L p30, BSLSTM p25, HSTM01 p28            |
| H07 EMG - Active Learning  | 43   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L p25                                     |
| H08 ECG Dive Reflex - Active Learning                              | 44   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L p25                                     |
| H09 Auditory Evoked Potential (AEP)                                | 44   |       |      |      |       |        |         |       |           |     |        | BSLSTM p25, OUT101 p31, BSLCBL6 p38          |
| H10 Hemispheric EEG  | 44   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L x2 p25                                  |
| H11 Mirror Test: Sensory Motor Learning & EDA                      | 44   |       | x    | x    |       |        | x       | x     |           |     |        | SS10L and SS57L p26                          |
| H12 Saccades: EOG  | 44   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L p25                                     |
| H13 Tracking: EOG  | 44   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L p25                                     |
| H14 Fixation I: EOG (3-lead)                                       | 44   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L p25                                     |
| H15 Fixation II: EOG (6-lead)                                      | 44   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L x2 p25                                  |
| H16 Reflexes & Reaction Time - Active Learning                     | 44   |       | x    | x    |       |        | x       | x     | x         | x   |        | SS10L and OUT1 p26                           |
| H17 Biomechanics   | 44   |       |      |      |       |        |         |       |           |     |        | SS2L x2 p25, SS21L p29                       |
| H18 Exercise Phys. - Continuous Noninvasive BP                     | 43   |       |      |      |       |        |         |       |           |     |        | NIBP100A p32                                 |
| H19 VO <sub>2</sub> & RER  | 45   |       |      |      |       |        |         |       |           |     |        | SS11LA p27, GASSYS2 and AFT6 p34             |
| H20 BME Filtering  | 43   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | no transducers required                      |
| H21 Impedance Cardiography (Cardiac Output)                        | 44   |       |      |      |       |        |         |       |           |     |        | SS2L p25, SS30L p28, SS31L p29               |
| H22 Visual Evoked Response (VER)                                   | 43   |       |      |      |       |        |         |       |           |     |        | SS2L p25, TSD122 p32                         |
| H23 Signal Averaged ECG  | 44   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L p25                                     |
| H24 Habituation  | 45   |       | x    | x    |       |        | x       | x     |           |     |        | SS2L p25, SS10L and SS57L p26                |
| H25 BME Signal Processing I (8 circuits)                           | 45   |       |      |      |       |        |         |       |           | x   |        | SS39L and (SS60L) p30                        |
| H26 BME Signal Processing II (ECG R-Wave Detector)                 | 43   |       |      |      |       |        |         |       |           | x   |        | SS39L and (SS60L) p30                        |
| H27 Facial EMG   | 44   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L x2 p25, (SS10L p26)                     |
| H28 Reflex Response (patellar tendon)                              | 43   |       |      |      |       |        |         |       |           |     |        | SS2L p25, SS36L p30, (SS20L p29)             |
| H30 Stroop Effect  | 44   |       |      |      |       |        |         |       |           |     |        | SS10L p26, STP35W p32                        |
| H31 Prepulse Inhibition  | 44   |       |      |      |       |        |         |       |           |     |        | SS2L p25, STP35W p32, (OUT100 web)           |
| H32 Heart Rate Variability Analysis                                | 44   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L p25                                     |
| H33 BME FFT Fast Fourier Transform                                 | 45   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | no transducers required                      |
| H34 Electrogastrogram from human (stomach)                         | 43   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | SS2L p25                                     |
| H35 Range of Motion: Sit & Reach                                   | 45   |       |      |      |       |        |         |       |           |     |        | SS21L p29                                    |
| H36 Muscular Biofeedback (auditory, visual, touch)                 | 45   |       | x    | x    |       |        | x       | x     | x         | x   |        | SS2L p25, OUT1 p26                           |
| A01 Frog Pith & Prep   | 45   | x     | x    | x    | x     | x      | x       | x     | x         | x   | x      | no transducers required                      |
| A02 Frog Gastrocnemius   | 45   |       |      |      |       | x      | x       |       |           |     | x      | SS12LA p27, STIM p25, ELSTM2 p38             |
| A03 Frog Sciatic Nerve   | 45   |       |      |      |       | x      | x       |       |           |     | x      | STIM p25, NERVE1/2 p38, BSLCBL p39           |
| A04 Frog Heart   | 45   |       |      | x    |       | x      | x       |       |           |     | x      | SS12LA p27, (HDW p31)                        |
| A05 Visceral Smooth Muscle   | 45   |       |      | x+   |       | x+     | x+      |       |           |     | x+     | SS12LA p27, (HDW p31), (ITBS100 p33)         |
| A06 Cockroach Ventral Nerve  | 45   |       |      |      |       | x      | x       |       |           |     | x      | BSLCBL8/9 p36, EL452 x3 p38                  |
| A07 Q <sub>10</sub> Principle (Dissolved O <sub>2</sub> -Goldfish) | 45   |       |      |      |       | x*     | x*      |       |           |     |        | SS69L p31 or BSL-TCI16 p39                   |
| A08 Action Potential in Earthworm                                  | 45   |       |      |      |       | x      | x       |       |           |     | x      | STIM p25, NERVE1/2 p38, BSLCBL p39           |
| A09 Properties of Turtle Heart Cardiac Muscle                      | 45   |       |      |      |       | x      | x       |       |           |     | x      | SS12LA p27, STIM p25, STM2+452 p38, CBL8 p36 |
| A10 Regulation of Circ. & Resp: Homeostasis                        | 45   |       |      |      |       |        |         |       |           |     |        | SS2L p25, SS13L p27, SS31L p29               |
| A11 Resting Potential - Crayfish Muscle                            | 45   |       |      |      |       | x†     | x†      |       |           |     | x†     | BSLCBL8 p36, (CBL204 x2 p39)                 |
| A12 Membrane Potential (muscle)                                    | 45   |       |      |      |       | x-     | x-      |       |           |     | x-     | BSLCBL8 p36, (CBL204 x2 p39)                 |
| A13 Active Transport (frog skin)                                   | 45   |       |      |      |       |        |         |       |           |     |        | BSLCBL8 p36, BSLCBL10 p38                    |
| A14 Central Pattern Generator (hornworm pupa)                      | 45   |       |      |      |       | x      | x       |       |           |     | x      | BSLCBL8 p36, EL452 x3 p38                    |
| A15 Earthworm Smooth Muscle  | 45   |       |      | x    |       | x      | x       |       |           |     | x      | SS12LA p27, (HDW p31), (ITBS100 p33)         |

\*interface included, probe required

+tissue bath required

†requires Crawdad CD-ROM Lab Manual

-glass microelectrode required