

THE MUSCLE SCHOOL

THE AUTHORITATIVE CURRICULUM

From Evolution to Expansion

7
ACTS

35
MODULES

106
LESSONS

39.8 primary instructional hours · 51.7 hours with reflection

Generated 28 August 2026 · Canon locked (Phases 1–5)

How this curriculum is built

Core reasoning model (ESACE)

Environment -> Stress -> Adaptation -> Capability -> Expansion

Pedagogical laws

- Teach WHY before HOW
- Teach first principles before applications
- Teach systems before isolated facts
- Teach understanding before prescriptions
- Teach environment before intervention
- Build curiosity before complexity

Lesson framework — Seven-Beat Lesson

#	Beat	Target (min)
1	Opening Question	0.5–1.5
2	Narrative Hook	1–3
3	Scientific Foundation	8–15
4	Systems Thinking	2–4
5	Practical Translation	3–5
6	Frontier Translation	2–5
7	Reflection	1–3

Certification tiers

Tier	Credential	Granted after
Foundation	Muscle School Foundations Certificate	Act IV
Application	Human Performance Translator Certificate	Act V
Frontier	Countermeasure Fluency Certificate	Act VI
Doctrine	Human Expansion Readiness Fellow	Act VII

What this is not

The Muscle School is an educational institution — not bodybuilding, medical school, astronaut training, diet product, coaching certification.

ACT I

Why Muscle Exists

Introduce the evolutionary purpose of skeletal muscle before its mechanism.

4 modules · 13 lessons

I.1 The Physics of Being Human

Disciplines: physics, evolutionary_biology, biomechanics

Lesson	Title	Prerequisite	Min
I.1.1	Why did life need muscle at all?	—	22
I.1.2	Gravity, the first coach	I.1.1	25
I.1.3	Force, load, and the currency of survival	I.1.2	26
I.1.4	The tissue that answers the environment	I.1.3	20

I.2 The Deep Human Past

Disciplines: paleoanthropology, evolutionary_biology, ecology

Lesson	Title	Prerequisite	Min
I.2.1	The trade that changed everything (bipedalism)	I.1.4	25
I.2.2	Endurance hunters	I.2.1	26
I.2.3	A day in a hunter-gatherer body	I.2.2	24
I.2.4	Muscle as social currency	I.2.3	22

I.3 Movement as Survival

Disciplines: evolutionary_biology, ecology, behavioral_biology

Lesson	Title	Prerequisite	Min
I.3.1	The four survival demands	I.2.4	24
I.3.2	Adaptation windows	I.3.1	22
I.3.3	What 'fitness' meant before it was a word	I.3.2	20

I.4 Act I Integration

Disciplines: evolutionary_biology, systems_biology

Lesson	Title	Prerequisite	Min
I.4.1	First-principles review	I.3.3	18
I.4.2	The reasoning loop (ESACE)	I.4.1	20

ACT II

The Biological Engine

Install the first-principles physiology every later Act depends on.

7 modules · 25 lessons

II.1 Anatomy of Muscle

Disciplines: anatomy, histology, biomechanics

Lesson	Title	Prerequisite	Min
II.1.1	The zoom (body to sarcomere)	I.4.2	25
II.1.2	Fiber types beyond myth	II.1.1	26
II.1.3	Fascia, tendon, aponeurosis	II.1.2	24
II.1.4	Muscle as an organ, not a mover	II.1.3	22

II.2 Cellular Machinery

Disciplines: cellular_biology, biochemistry, biophysics, neurophysiology

Lesson	Title	Prerequisite	Min
II.2.1	The sarcomere — how force is made	II.1.4	28
II.2.2	Actin, myosin, and the cross-bridge cycle	II.2.1	26
II.2.3	Excitation–contraction coupling	II.2.2	24
II.2.4	Energetics: ATP, PCr, glycolysis, oxidative	II.2.3	28

II.3 Growth, Repair, and Protein Synthesis

Disciplines: molecular_biology, biochemistry, stem_cell_biology, exercise_physiology

Lesson	Title	Prerequisite	Min
II.3.1	The balance (synthesis vs. breakdown)	II.2.4	25
II.3.2	mTOR — the anabolic signal	II.3.1	24
II.3.3	Satellite cells	II.3.2	22
II.3.4	Timelines of adaptation	II.3.3	24

II.4 The Nervous System as First Author

Disciplines: neurophysiology, motor_control, exercise_science

Lesson	Title	Prerequisite	Min
II.4.1	Motor units and recruitment	II.3.4	24
II.4.2	Rate coding	II.4.1	22
II.4.3	Skill inside strength	II.4.2	22
II.4.4	Why beginners get strong before they get bigger	II.4.3	20

II.5 Endocrine, Metabolic, Myokine Environment

Disciplines: endocrinology, metabolism, systems_biology

Lesson	Title	Prerequisite	Min
II.5.1	Hormones in context	II.4.4	24
II.5.2	Insulin sensitivity and muscle	II.5.1	24
II.5.3	Myokines — muscle as an endocrine organ	II.5.2	24
II.5.4	The whole-body signal	II.5.3	22

II.6 Bone, Tendon, and the Load Path

Disciplines: orthopedics, mechanobiology, biomechanics

Lesson	Title	Prerequisite	Min
II.6.1	Wolff's law and mechanotransduction	II.5.4	22
II.6.2	Tendon on a different clock	II.6.1	22
II.6.3	The load path as one system	II.6.2	22

II.7 Act II Integration

Disciplines: systems_biology

Lesson	Title	Prerequisite	Min
II.7.1	The engine, decoded	II.6.3	20
II.7.2	The Act III hypothesis	II.7.1	18

ACT III

Civilization

Prove that biology is constant while the environment has collapsed.

4 modules · 11 lessons

III.1 The Great Environmental Shift

Disciplines: history_of_technology, epidemiology, public_health, ergonomics

Lesson	Title	Prerequisite	Min
III.1.1	Agriculture, industry, and the collapse of load	II.7.2	24
III.1.2	Calorie abundance meets movement scarcity	III.1.1	24
III.1.3	The chair	III.1.2	20

III.2 The Sedentary Phenotype

Disciplines: clinical_physiology, epidemiology, gerontology

Lesson	Title	Prerequisite	Min
III.2.1	Sarcopenia and dynapenia	III.1.3	24
III.2.2	Metabolic syndrome as environmental disease	III.2.1	24
III.2.3	The disuse cascade	III.2.2	22

III.3 The Aging Curve (as environment, not fate)

Disciplines: gerontology, geriatric_medicine, public_health

Lesson	Title	Prerequisite	Min
III.3.1	Muscle across the decades	III.2.3	24
III.3.2	Compression of morbidity vs. extension of frailty	III.3.1	22
III.3.3	Independence, dignity, and grip	III.3.2	20

III.4 Act III Integration

Disciplines: public_health, systems_biology

Lesson	Title	Prerequisite	Min
III.4.1	Biology constant, environment collapsed	III.3.3	18
III.4.2	The replacement hypothesis	III.4.1	18

ACT IV

Countermeasures

Introduce exercise as intentional environmental replacement.

6 modules · 18 lessons

IV.1 Exercise as Environmental Replacement

Disciplines: exercise_physiology, aerospace_medicine, systems_biology

Lesson	Title	Prerequisite	Min
IV.1.1	The countermeasure concept	III.4.2	22
IV.1.2	What 'stimulus' means to a cell	IV.1.1	24
IV.1.3	Dose, frequency, recovery	IV.1.2	24

IV.2 Resistance Training First Principles

Disciplines: exercise_science, motor_learning, biomechanics

Lesson	Title	Prerequisite	Min
IV.2.1	Progressive overload	IV.1.3	24
IV.2.2	Volume, intensity, proximity to failure	IV.2.1	26
IV.2.3	The specificity paradox	IV.2.2	22

IV.3 Recovery Biology

Disciplines: sleep_science, endocrinology, sports_medicine

Lesson	Title	Prerequisite	Min
IV.3.1	Sleep as anabolic infrastructure	IV.2.3	24
IV.3.2	Stress, cortisol, and the recovery window	IV.3.1	22
IV.3.3	Deload and injury as information	IV.3.2	22

IV.4 Nutrition as Signal

Disciplines: nutrition_science, biochemistry, sports_nutrition

Lesson	Title	Prerequisite	Min
IV.4.1	Protein — quantity, quality, distribution	IV.3.3	26
IV.4.2	Energy availability	IV.4.1	24
IV.4.3	Micronutrients that matter	IV.4.2	22
IV.4.4	Hydration and electrolytes	IV.4.3	20

IV.5 Habit, Identity, and Adherence

Disciplines: behavioral_psychology, health_behavior

Lesson	Title	Prerequisite	Min
IV.5.1	Why programs fail and behavior wins	IV.4.4	22
IV.5.2	Identity-based training	IV.5.1	22
IV.5.3	The 20-year athlete	IV.5.2	22

IV.6 Act IV Integration

Disciplines: systems_biology

Lesson	Title	Prerequisite	Min
IV.6.1	Countermeasure literacy	IV.5.3	20
IV.6.2	From replacement to application	IV.6.1	18

Human Performance

Prove elite performance is precise application of the same biology.

6 modules · 17 lessons

V.1 The Aging Athlete (Everyone)

Disciplines: gerontology, geriatric_medicine, rehab_science, public_health

Lesson	Title	Prerequisite	Min
V.1.1	Strength as insurance	IV.6.2	24
V.1.2	Falls, fractures, and the last mile	V.1.1	22
V.1.3	Grandparents who can carry their grandchildren	V.1.2	20

V.2 The Sport Athlete

Disciplines: sport_science, biomechanics, exercise_physiology

Lesson	Title	Prerequisite	Min
V.2.1	What separates elite from good	V.1.3	24
V.2.2	Sport as a specific environment	V.2.1	24
V.2.3	Peaking, periodization, durability	V.2.2	22

V.3 Tactical Performance

Disciplines: occupational_physiology, military_science, orthopedic_epidemiology

Lesson	Title	Prerequisite	Min
V.3.1	The operator load model	V.2.3	24
V.3.2	Load-carriage physiology	V.3.1	22
V.3.3	Injury as the true enemy	V.3.2	20

V.4 Aviation and High-G Environments

Disciplines: aerospace_medicine, aviation_physiology, ergonomics

Lesson	Title	Prerequisite	Min
V.4.1	The G-force body	V.3.3	22
V.4.2	Pilots as athletes	V.4.1	22
V.4.3	Sustained attention as physical performance	V.4.2	20

V.5 The Executive & Knowledge Worker

Disciplines: occupational_medicine, cognitive_neuroscience, exercise_brain_research

Lesson	Title	Prerequisite	Min
V.5.1	Cognitive performance is physical performance	V.4.3	22
V.5.2	The sitting profession	V.5.1	22
V.5.3	Longevity as a career asset	V.5.2	20

V.6 Act V Integration

Disciplines: systems_biology

Lesson	Title	Prerequisite	Min
V.6.1	One biology, many environments	V.5.3	18
V.6.2	The transition to frontier	V.6.1	18

The Frontier

Transition to environments where gravity itself is negotiable.

5 modules · 14 lessons

VI.1 The Physics of Elsewhere

Disciplines: space_physiology, aerospace_medicine, radiation_biology

Lesson	Title	Prerequisite	Min
VI.1.1	Microgravity — load disappears	V.6.2	26
VI.1.2	Partial gravity — Moon and Mars	VI.1.1	24
VI.1.3	The multi-stressor environment	VI.1.2	24

VI.2 What We Learned From Orbit

Disciplines: space_medicine, cardiovascular_physiology, orthopedics

Lesson	Title	Prerequisite	Min
VI.2.1	Sixty years of orbital physiology	VI.1.3	24
VI.2.2	Bone, muscle, cardiovascular deconditioning	VI.2.1	26
VI.2.3	Neurovestibular and fluid shifts	VI.2.2	24

VI.3 Countermeasures Off-Earth

Disciplines: aerospace_medicine, human_factors, exercise_physiology

Lesson	Title	Prerequisite	Min
VI.3.1	The ARED, T2, CEVIS	VI.2.3	24
VI.3.2	What has worked, what hasn't	VI.3.1	24
VI.3.3	The 2.5-hour prescription and its limits	VI.3.2	22

VI.4 Long-Duration & Deep-Space

Disciplines: space_physiology, human_factors, behavioral_health

Lesson	Title	Prerequisite	Min
VI.4.1	The Mars transit problem	VI.3.3	24
VI.4.2	Surface operations after transit	VI.4.1	22
VI.4.3	Autonomy and self-directed training	VI.4.2	22

VI.5 Act VI Integration

Disciplines: systems_biology, space_physiology

Lesson	Title	Prerequisite	Min
VI.5.1	The frontier body	VI.4.3	20
VI.5.2	Convergence primer	VI.5.1	18

ACT VII

Human Expansion Readiness

Reveal the single problem all previous acts have been solving.

3 modules · 8 lessons

VII.1 The Convergence Thesis

Disciplines: systems_biology, evolutionary_biology, space_physiology

Lesson	Title	Prerequisite	Min
VII.1.1	Hunter, athlete, operator, spacefarer	VI.5.2	24
VII.1.2	The universal law	VII.1.1	22
VII.1.3	Preparedness as a civilizational skill	VII.1.2	22

VII.2 Human Expansion Readiness (HXR)

Disciplines: systems_biology, aerospace_medicine, behavioral_psychology

Lesson	Title	Prerequisite	Min
VII.2.1	Defining HXR	VII.1.3	22
VII.2.2	The readiness stack	VII.2.1	22
VII.2.3	The individual as a species-scale asset	VII.2.2	22

VII.3 Course Culmination

Disciplines: systems_biology

Lesson	Title	Prerequisite	Min
VII.3.1	Doctrine at graduate level	VII.2.3	22
VII.3.2	Where you go next	VII.3.1	20