Next Generation Higher National Unit Specification

Training Principles for Personal Trainers (SCQF level 8)

Unit code: J7C6 48

SCQF level: 8 (16 SCQF credit points)

Valid from: session 2024–25

Prototype unit specification for use in pilot delivery only (version 2.0) August 2024

This unit specification provides detailed information about the unit to ensure consistent and transparent assessment year on year.

This unit specification is for teachers and lecturers and contains all the mandatory information required to deliver and assess the unit.

This edition: August 2024 (version 2.0)

Unit purpose

This unit develops learners' knowledge and understanding of the planning processes involved in providing personal training support to different client groups. Learners develop their practical skills by carrying out client consultations and physical assessments with a specified client group (sedentary; recovering from an injury; over-trained; high-level performer; sport-specific performer; or clients with low-risk health conditions). Learners further develop their knowledge and apply their skills by carrying out training interventions with clients. They also develop their knowledge and understanding of anatomy, physiology and applied biomechanics.

Entry requirements

Learners must have completed one of the following qualifications before undertaking the Professional Development Award (PDA) in Personal Trainer:

- Higher National Certificate (HNC) Physical Activity and Health
- HNC Fitness, Health and Exercise
- an industry-recognised fitness qualification, for instance Gym Instructor or Group Exercise Instructor

Centres must ensure learners undertaking the qualification are at least 16 years old prior to the course start date due to Student Public Liability Insurance requirements.

We recommend that learners have some experience and/or participation in a sport or fitness environment. We also recommend that learners possess communication skills to a level equivalent to at least SCQF level 6.

The unit is a mandatory unit in the Next Generation: Higher National Diploma (HND) in Physical Activity and Health (SCQF level 8) or can be delivered as a stand-alone unit. You can teach the unit in conjunction with the Exercise Practitioner 2 (3-credit) unit as part of the PDA in Personal Training (SCQF level 8).

Unit outcomes

Learners who complete this unit can:

1 conduct and analyse a lifestyle management consultation for a client
2 conduct and analyse a range of health and performance-based fitness tests to establish baseline measurements for a client
3 develop an individual training intervention for a client
4 develop a range of fitness-based exercise techniques
5 analyse the effects of exercise on the body systems and discuss the interaction between exercise prescription and effective application as a personal trainer
6 critically analyse the biomechanics of human movement (kinesiology) and apply this effectively during exercise delivery

Evidence requirements

Learners can generate evidence through stand-alone assignments or portfolio work.

Outcomes 1, 2, 3, 4 and 6

Learners must complete these outcomes with a minimum of one client, chosen from the following client groups:

- sedentary
- recovering from an injury
- over-trained
- high-level performer
- sport-specific performer
- clients with low-risk health conditions

Conduct and analyse a lifestyle management consultation for a client (outcome 1)

Learners must conduct a client consultation and analyse the information collated with a minimum of one client from the client groups listed at the start of the evidence requirements. Learners must provide the following evidence:

- practical observation
- consultation documents for learners to collate the client's personal and medical information
- analysis and feedback of client information

During the consultation and analysis process, learners must:

- collect the information they need to design, tailor and coach an effective exercise programme
- obtain informed consent
- conduct pre-exercise assessment screening to assess if onward referral for the client is advised and, where necessary, refer the client to a more appropriate professional
- seek and receive information from other relevant professionals concerning the client, where indicated
- use recognised pre-exercise health screening and risk stratification methods to assess if a client is ready to exercise, and if they need to be signposted or referred to other specialist exercise professionals and/or medical professionals
- offer advice and guidance within the scope of practice to promote positive healthy lifestyle choices
- develop a nutritional questionnaire and/or food diary (this allows for analysis in the Exercise Practitioner 2 unit)

The consultation can be conducted either live or through a video submission. The assessor must use an assessor checklist.

Conduct and analyse a range of health and performance-based fitness tests to establish baseline measurements for a client (outcome 2)

Learners must conduct and analyse appropriate health and performance-based fitness assessments for a minimum of one client from the listed client groups stated at the start of the evidence requirements. Learners must provide the following evidence:

- practical observation of health and fitness assessments
- analysis of results

When carrying out their health and fitness assessments, learners must:

- educate their client on the purpose and value of pre-exercise assessments
- select assessments appropriate to the individual client, including:
  - a minimum of two health-related assessments
  - a minimum of two performance-based fitness assessments
- select assessments appropriate to the assessment conditions, equipment and time available
- conduct basic postural analysis on client
- advise client of correct procedures, protocols and risks before starting any physical assessment or assessments
- supervise the client physical assessment in a safe and effective manner

Learners must be observed in a live environment or submit recorded video evidence to meet the requirements. The assessor must record evidence for the practical observation in an assessor checklist.

When analysing their assessment data, learners must show they can:

- interpret results and/or recorded data, using accepted criteria
- develop a summary profile of the client to assist in the design of a safe and effective programme tailored to their specific needs
- inform the client of analysis outcomes and discuss and agree actions and/or goals. Learners must:
  - use language and terms the client understands
  - simplify technical information
  - effectively use communication and interpersonal skills
- carry out regular assessments and/or re-assessments to monitor client progress and achievement of goals

Develop an individual training intervention for a client (outcome 3)

Learners must develop an individual 12-week exercise training intervention for a minimum of one client from the listed client groups stated at the start of the evidence requirements. They must:

- include a minimum of two weekly sessions that are a minimum of 45 minutes each
- select a minimum of two components of fitness from health and/or skill-related component categories
- Select either strength or local muscular endurance from the health-related components of fitness
- apply the current American College of Sports Medicine (ACSM) or other recognised international guidelines for developing the different components of fitness within programme design

When planning their intervention, learners must show they can:

- plan timings and sequences for the session
- determine and vary modality and intensity of exercise
- allocate equipment and/or resources required
- incorporate teaching strategies to enhance client performance
- link session to client goals (short, medium and long-term goals)
- incorporate warm-up and cool-down activities appropriate to the session or individual
- consider how to train clients in a minimum of one of the following environments from the list below:
  - gym
  - studio or sports hall
  - outdoors
  - the client's home or other confined space
- plan sessions for either an individual or a small group. They must provide planning for how they would adapt one session for an unselected client group

- apply acute training variables for each fitness component intervention developed in the 12-week exercise training programme
- apply and justify application of training principles where possible, and include them in the 12-week planned programme

Learners must show they've applied exercise science to design and deliver their programme, including:

- the musculoskeletal system, for example:
  - musculoskeletal structure
  - muscle physiology
  - postural abnormalities
  - physiological adaptations to exercise
  - measuring exercise response
  - exercise risks
- biomechanical concepts, for example:
  - resistance training equipment
  - exercise intensity
  - exercise safety and contraindications
- physiological concepts, for example:
  - nervous and endocrine system
  - overtraining
  - effects of various environmental conditions on exercise response
  - effects of various individual factors on exercise response
  - dose-response relationship
- cardio-respiratory system and energy systems, for example:
  - structure and function of the cardiorespiratory system
  - cardiac cycle
  - transport and gaseous exchange
  - aerobic and anaerobic systems
  - heart rate response to exercise
  - oxygen demands of different activities
  - physiological adaptations to exercise

Develop a range of fitness-based exercise techniques (outcome 4)

Learners must provide the following evidence:

- training method plan
- practical observation

Training method plan

Learners must develop a range of training methods for a minimum of two for each of the following components:

- cardiovascular exercise, for example:
  - steady state
  - interval
  - fartlek
- resistance exercise, for example:
  - a range of training systems
  - exercise equipment
  - fixed and free weight
- functional exercise, for example:
  - movement patterns
  - muscle actions
  - components of fitness that mirror a client's functional requirements
- flexibility exercise, to facilitate increased range of motion, including:
  - static,
  - ballistic
  - dynamic and proprioceptive neuromuscular techniques, including the myotactic/stretch reflex

Learners deliver these sessions in a practical setting.

For each training method, learners must provide the following evidence:

- the type of method
- key exercises to perform the method
- training variables, including:
  - sets
  - reps
  - rest time
  - training load and/or intensity
- appropriate teaching points
- key muscle groups

Practical observation

Learners must deliver a minimum of one method for each of these specified fitness exercise techniques:

- cardiovascular exercise, for example:
  - steady state
  - interval
  - fartlek
- resistance exercise, for example:
  - a range of training systems
  - exercise equipment
  - fixed and free weight
- functional exercise, for example:
  - movement patterns
  - muscle actions
  - components of fitness that mirror a client's functional requirements
- flexibility exercise to facilitate increased range of motion, including:
  - static
  - ballistic
  - dynamic and proprioceptive neuromuscular techniques, including the myotatic (stretch) reflex

Learners must be observed in a live environment or submit recorded video evidence to meet the requirements. The assessor must record evidence for the practical observation in an assessor checklist.

Analyse the effects of exercise on the body systems and discuss the interaction between exercise prescription and effective application as a personal trainer (outcome 5)

You can assess this outcome using sampling. If you choose to assess evidence on a sample basis, you must:

- include at least 50% of the knowledge items
- teach all content in the 'Knowledge and skills' section
- sample different knowledge items for each assessment

You must not tell learners which knowledge items are in the assessment beforehand.

Learners must show they can:

- analyse the function of bones:
  - the role of osteoblasts; osteoclasts; hormonal contribution; body weight; calcium; and vitamin D in bone density

- analyse the effects of exercise on bones:
  - weight bearing and non-weight-bearing exercise
  - acute and chronic effects
  - stabilisation of the body
  - neutral spine alignment
  - potential ranges of movement of the spine
  - transmission of stress caused by impact, body weight, bone density
- analyse the function of joints:
  - joint stability
  - passive and active structures
  - shock absorption, for example natural curves of the spine
- analyse the effects of exercise on joints:
  - effect of muscle contractions and movements, for example posture, impact, body weight
  - active stability of joints: key joints at risk (spine, shoulder joint)
- analyse the risks:
  - lack of biomechanical efficiency
  - reduction in transmission of stress
  - increased risk of injury
  - increased loading placed on synergists
- analyse the classification and structure of muscles — muscles and muscle attachment sites (origins and insertions) — to cover:
  - rotator cuff: SITS (supraspinatus; infraspinatus; teres minor; subscapularis)
  - shoulder girdle: levator scapulae; pectoralis minor; serratus anterior; trapezius; rhomboids major and minor; teres major
  - spinal extensors: erector spinae; iliocostalis; longissimus; spinalis; multifidus; quadratus lumborum
  - hip flexors (iliopsoas): iliacus; psoas major
  - adductors: magnus, brevis; longus; pectineus; gracilis; sartorius
  - abductors: gluteus medius; gluteus minimus; piriformis; tensor fascia latae
  - abdominals: internal and external obliques; transversus abdominus
  - intercostals: diaphragm
  - ‘core’ and pelvic floor muscles
  - local and/or deep, global and/or superficial muscles
- analyse the function of muscles:
  - muscle actions: to cover muscles listed in previous bullet
  - roles of major muscles: prime mover (agonist), antagonist, synergist, fixators
  - ‘core’ and pelvic floor muscles
  - local and/or deep; global and/or superficial

- analyse the effects of exercise on muscles:
  - delayed onset of muscles soreness (DOMS), muscle fatigue
  - response to overuse, underuse and misuse, for example shortening and/or weakening, altered roles and/or synergists becoming prime movers
- analyse the classification and structure of biological systems:
  - muscular and skeletal
  - signs and symptoms of overtraining
  - cardiovascular: cardiac cycle, stroke volume, cardiac output
  - endocrine: hormones and glands
  - endocrine: hormonal responses
- analyse the function of biological systems:
  - nervous: sensory input, interpretation, motor output
  - endocrine: secretion of hormones
- analyse the effects of exercise on biological systems:
  - nervous: motor unit recruitment, inter and intramuscular coordination, neuromuscular coordination
  - endocrine: hormonal responses
- analyse the effects of exercise on energy systems:
  - ATP re-synthesis
  - aerobic and anaerobic threshold
  - effects of different training methods and/or systems

Critically analyse the biomechanics of human movement (kinesiology) and apply effectively during exercise delivery (outcome 6)

Learners must show they can:

- analyse the effect of exercise variables on biomechanics and kinesiology, give an example of each, and consider their advantages and disadvantages:
  - levers
  - gravity and centre of gravity
  - momentum
  - force
  - planes of motion
  - length-tension relationships
  - open- and closed-chain kinetic movements
- analyse the effect of exercise on posture:
  - core stabilisation exercises
  - impact on posture
  - potential for injury and aggravation of problems
- analyse abnormal degrees of curvature of the spine and their implications:
  - medical conditions associated with dysfunctional stabilisation, such as common spinal disorders

Learners generate evidence by showing that they can apply the knowledge they learn from the client-based exercise training intervention.

Knowledge and skills

The following table shows the knowledge and skills covered by the unit outcomes:

Knowledge	Skills
Outcome 1 Learners should understand: ♦ how to use evidence-based pre-exercise health screening methods, for example: — PAR-Q and PAR-Q+ D (physical activity readiness questionnaire) — organisation and/or employer-devised methods ♦ risk stratification models and when to signpost or refer clients to other specialist exercise professionals and/or medical professionals: — how to risk-stratify clients: clear understanding of the absolute contraindications to exercise and factors that indicate that a client is at low, medium or high risk of an adverse event occurring during exercise and/or propensity for risk ♦ recognised tools, for example: — Irwin and Morgan traffic light system — ACSM categories — national and/or locally agreed protocols and referral pathways (where and when they exist) ♦ client's relevant health history and current health status, particularly in relation to risk factors for heart disease ♦ how to identify medical conditions that necessitate medical clearance, referral to an appropriate medical professional or other clinician or medically supervised exercise programme ♦ past and present injuries and disabilities ♦ how to gain informed consent	**Outcome 1** Learners can: ♦ use recognised pre-exercise health screening and risk stratification methods to assess a client's readiness to exercise and potential need to signpost or refer them to other specialist exercise professionals and/or medical professionals ♦ offer advice and guidance within scope of practice to promote positive healthy lifestyle choices. ♦ collect the information required to design, tailor and coach an effective exercise programme ♦ obtain informed consent ♦ conduct pre-exercise assessment screening to assess if onward referral of client is advised and, where necessary, refer the client to a more appropriate professional ♦ seek and receive information from other relevant professionals concerning the client, where indicated ♦ set SMART goals linked to a client's individual needs, wants and motivators ♦ monitor targets, review and evaluate progress, and adapt accordingly ♦ apply appropriate methods and techniques to facilitate clients' desired physiological goals

Knowledge	Skills
Outcome 1 (continued) Learners should understand: ♦ how to incorporate using nutritional assessment tools, for example: — food diary — food recall — food frequency questionnaires — body composition assessment ♦ how to seek evidence-based and/or reputable health and wellbeing advice: — organisations and websites with information they can use or signpost clients to, for example: NHS Choices, British Heart Foundation, SSHES Active, Change4Life Department of Health Campaign, Diabetes UK — UK Chief Medical Officer national recommended guidelines for physical activity and health — evidence-based health benefits of physical activity — dose-response relationship — how to research unfamiliar medical conditions in relation to exercise participation and/or advice ♦ professional role and scope of practice in relation to other relevant specialists when offering health and wellbeing advice and guidance: — for example, roles and scope of practice of personal trainers, doctors, physiologists, physiotherapists, occupational therapists, strength and conditioning coach, dietitian and/or nutritionists, exercise referral instructors — liaising with other professionals regarding unfamiliar medical conditions	

Knowledge	Skills
Outcome 1 (continued) Learners should understand: ♦ the consultation process: — how to conduct a one-to-one consultation — how to use lifestyle questionnaires to gather relevant information, for example previous and current level of activity, exercise likes and dislikes ♦ how to monitor and review client progress: — how to use regular assessments to monitor client progress towards achieving their goal — how to revise an exercise programme in consultation with a client based on results, goals, individual needs and changing circumstances ♦ how to set and adapt meaningful SMART goals linked to a client's individual needs, wants and motivators: — how to set goals with clients — how to evaluate client progress through the monitoring and review of agreed goals — how to adapt goals according to progress and individual circumstances	
Outcome 2 Learners should understand: ♦ how to choose and implement client assessments that include: — choosing assessments appropriate to the client and assessment conditions: to cover with and without equipment, individual versus group assessment, factors affecting assessment validity, reliability and objectivity	**Outcome 2** Learners can: ♦ collect the information required to design, tailor and coach an effective exercise programme ♦ obtain informed consent ♦ conduct a pre-exercise assessment screening to assess if onward referral of client is advised, and where necessary, refer the client to a more appropriate professional

Knowledge	Skills
Outcome 2 (continued) Learners should understand: ♦ how to choose and implement client assessments that include: — range of assessments, for example resting heart rate and blood pressure, cardio-respiratory fitness, muscular strength, muscular endurance, flexibility, body composition, contraindications and limitations for testing — postural assessment including: static and dynamic postural analysis, optimal postural alignment, postural deficiencies and/or deviations ♦ how to monitor and review client progress, including: — how to use regular assessments to monitor client progress towards achieving their goal — how to revise an exercise programme in consultation with a client, based on results, goals, individual needs and changing circumstances ♦ the effects of exercise on bones: — neutral spine alignment ♦ abnormal degrees of curvature of the spine and their implications: — medical conditions associated with dysfunctional stabilisation, such as common spinal disorders	**Outcome 2 (continued)** Learners can: ♦ seek and receive information from other relevant professionals concerning the client, where appropriate ♦ educate client on purpose and value of pre-exercise assessments ♦ select assessments appropriate to the individual client ♦ select assessments appropriate to the assessment conditions, equipment and time available ♦ advise client of correct procedures, protocols and risks before starting any physical assessment or assessments ♦ supervise client physical assessment in a safe and effective manner ♦ conduct basic postural analysis on client ♦ interpret results and/or recorded data, using accepted criteria ♦ inform client of analysis outcomes and discuss and agree on actions and/or goals, using language and terms the client understands, by: — simplifying technical information — effectively using communication and interpersonal skills ♦ develop a summary profile of client to assist in the design of a safe and effective programme tailored to their specific needs ♦ carry out regular assessments and/or re-assessments to monitor client progress and achievement of goals

Knowledge	Skills
Outcome 3 Learners should understand: ♦ how to design and tailor exercise programmes for a range of clients within scope of practice, including: — sedentary, recovering from an injury, over-trained, high-level performer, sport-specific performer, clients with low-risk health conditions — how to apply the principles of training to exercise programme design to develop, cardiovascular endurance, muscular strength (hypertrophy and endurance), flexibility, body composition, posture and core stability, motor skills — the advantages and disadvantages of exercising at various intensities for: sedentary (untrained) experienced (trained), high-level performers (well trained) ♦ a range of different protocols and tools, including: — performing calculations of repetition maximums (1RM to 10RM) — methods of monitoring exercise intensity, including: maximum heart rate formula, rate of perceived exertion (RPE) scales, both 6 to 20 and 1 to 10, metabolic equivalents (METs), kilocalories per hour (Kcal.hr), visual assessment and verbal assessment (talk test) — the repetition ranges for strength, power, endurance and muscle hypertrophy — heart rate training zone models for developing aerobic and anaerobic capacity — the current ACSM or other recognised international guidelines for developing the different components of fitness	**Outcome 3** Learners can: ♦ plan timings and sequences for the session ♦ incorporate teaching strategies to enhance client performance ♦ determine and vary modality and intensity of exercise ♦ allocate equipment and/or resources required ♦ link session to client goals (short, medium and long-term goals) ♦ incorporate warm-up and cool down activities appropriate to the session and individual ♦ plan sessions in different environments, including: — gym — studio or sports hall — outdoors — client's home or other confined space ♦ plan sessions for both individuals and small groups ♦ show they've applied exercise science to design their programme: — the musculoskeletal system design, for example: musculoskeletal structure, muscle physiology, postural abnormalities, physiological adaptations to exercise, measuring exercise response, exercise risks — biomechanical concepts to programme design, for example: resistance training equipment, exercise intensity, exercise safety and contraindications

Knowledge	Skills
Outcome 3 (continued) Learners should understand: ♦ a range of different protocols and tools, including: — relevant guidelines for hands-on-contact with clients, with reference to relevant code of ethics and/or health and safety guidelines — the reasons for using periodisation or progressive programming and the principles behind them ♦ the variables of training and how to tailor exercise programmes to support goal achievement: — how to manipulate the frequency, intensity, time, type (FITT) principle to tailor exercise programmes, for example: choice of exercises; sequence of exercise; resistance and repetitions; number of sets; rest between sets (recovery); speed of movement; type of muscle contraction; duration of session; rest between sessions; volume of training; split routines; development of aerobic and anaerobic CV fitness; strength; endurance; hypertrophy; speed and power ♦ understand the principles of training and how they relate to exercise programme design: — including specificity; progressive overload; reversibility; adaptability; individuality; and recovery time and how they relate to individual wants, goals and needs — the importance of adequate rest phases between training loads and the signs and symptoms of overtraining	**Outcome 3 (continued)** Learners can: ♦ show they've applied exercise science to design their programme: — physiological concepts to programme design, for example: nervous and endocrine system; overtraining; effects of various environmental conditions on exercise response; effects of various individual factors on exercise response; dose-response relationship — cardio-respiratory system and energy systems to programme design, for example: structure and function of the cardiorespiratory system; cardiac cycle; transport and gaseous exchange; aerobic and anaerobic systems; heart rate response to exercise; oxygen demands of different activities; physiological adaptations to exercise

Knowledge	Skills
Outcome 3 (continued) Learners should understand: ♦ how to design and deliver different modes of exercise in different environments: — different environments examples: gym; studio or sports hall; outdoors; the client's home or confined space — exercise modes examples: resistance training (machines, free weights, body weight); cardiovascular (CV) training; circuit training; body conditioning; core exercise; flexibility training ♦ how to design sessions that can be delivered to small groups, ensuring the safety of all clients at all times: — how to design effective small group PT sessions — how to balance the needs of the individual and the group ♦ a range of fitness training techniques: — cardiovascular exercise, for example, steady state, interval, fartlek — resistance exercise, for example, a range of training systems, exercise equipment, fixed and free weights — functional exercise, for example, movement patterns, muscle actions and components of fitness which mirror a client's functional requirements — flexibility exercise, including static, ballistic, dynamic and proprioceptive neuromuscular techniques (including the myotactic/stretch reflex) to facilitate increased range of motion	

Knowledge	Skills
Outcome 4 Learners should understand: ♦ a range of fitness training techniques: — cardiovascular exercise, for example, steady state, interval, fartlek — resistance exercise, for example, a range of training systems, exercise equipment, fixed and free weights — functional exercise, for example, movement patterns, muscle actions and components of fitness that mirror a client's functional requirements — flexibility exercise, including static, ballistic, dynamic and proprioceptive neuromuscular techniques, including the myotactic/stretch reflex, to facilitate increased range of motion	**Outcome 4** Learners can: ♦ use appropriate teaching methods and skills to instruct: — cardiovascular exercise, for example, steady state, interval, fartlek — resistance exercise, for example, a range of training systems, exercise equipment, fixed and free weight — functional exercise, for example, movement patterns, muscle actions and components of fitness that mirror a client's functional requirements — flexibility exercise, including static, ballistic, dynamic and proprioceptive neuromuscular techniques, including the myotactic/stretch reflex, to facilitate increased range of motion
Outcome 5 Learners should understand: ♦ the function of bones: — the role of osteoblasts, osteoclasts, hormonal contribution, body weight, calcium and vitamin D in bone density ♦ the effects of exercise on bones: — weight bearing and non-weight-bearing exercise — acute and chronic effects — stabilisation of the body — neutral spine alignment — potential ranges of movement of the spine — transmission of stress caused by impact, body weight, bone density	

Knowledge	Skills
Outcome 5 (continued) Learners should understand: ♦ the function of joints: — joint stability, passive and active structures, shock absorption, for example natural curves of the spine ♦ the effects of exercise on joints: — effect of muscle contractions and movements, for example posture, impact, body weight — active stability of joints: key joints at risk (spine, shoulder joint) ♦ risks: — lack of biomechanical efficiency — reduction in transmission of stress — increased risk of injury — increased loading placed on synergists ♦ the classification and structure of muscles — muscles and muscle attachment sites (origins and insertions), to cover: — rotator cuff: SITS — shoulder girdle: levator scapulae; pectoralis minor; serratus anterior; trapezius; rhomboids major and minor; teres major — spinal extensors: erector spinae; iliocostalis; longissimus; spinalis; multifidus; quadratus lumborum — hip flexors (iliopsoas): iliacus; psoas major — adductors: magnus; brevis; longus; pectineus; gracilis; sartorius — abductors: gluteus medius; gluteus minimus; piriformis; tensor fascia latae — abdominals: internal and external obliques, transversus abdominus — intercostals: diaphragm	

Knowledge	Skills
Outcome 5 (continued) Learners should understand: ♦ the classification and structure of muscles — muscles and muscle attachment sites (origins and insertions), to cover: — 'core' and pelvic floor muscles — local and/or deep, global and/or superficial muscles ♦ the function of muscles: — muscle actions: to cover muscles listed in previous bullet — roles of major muscles: prime mover (agonist), antagonist, synergist, fixators — 'core' and pelvic floor — local and/or deep, global and/or superficial ♦ the effects of exercise on muscles: — DOMS, muscle fatigue — response to overuse, underuse, misuse, for example: shortening or weakening, altered roles and synergists becoming prime movers ♦ the classification and structure of biological systems: — muscular and skeletal — signs and symptoms of overtraining — cardiovascular: cardiac cycle, stroke volume, cardiac output — endocrine: hormones and glands — endocrine: hormonal responses ♦ the function of biological systems: — nervous: sensory input, interpretation, motor output — endocrine: secretion of hormones	

Knowledge	Skills
Outcome 5 (continued) Learners should understand: ♦ the effects of exercise on biological systems: — nervous: motor unit recruitment, inter and intramuscular coordination, neuromuscular coordination — endocrine: hormonal responses ♦ the effects of exercise on energy systems: — ATP re-synthesis — aerobic and anaerobic threshold — effects of different training methods and/or systems	
Outcome 6 Learners should understand: ♦ the effect of exercise variables on biomechanics and kinesiology, including: — levers — gravity/centre of gravity — momentum — force — planes of motion — length-tension relationships — open- and closed-chain kinetic movements, with examples of each and a consideration of their advantages and disadvantages ♦ the effect of exercise on posture: — core stabilisation exercises — impact on posture — potential for injury and aggravation of problems — medical conditions associated with dysfunctional stabilisation, such as common spinal disorders	

Meta-skills

Throughout the unit, learners develop meta-skills to enhance their employability in the sport and physical activity sector.

Self-management

This meta-skill includes:

- focusing: collating and organising information from the client consultation process and through the health and fitness assessments — in outcomes 1, 2, and 3
- integrity: understanding ethics; being aware of acting on values and principles; work ethic; timekeeping; reliability; discipline; trustworthiness when working with clients during consultation and testing process — in outcomes 1, 2, and 4
- adapting: adapting teaching styles; decision making; being responsible; responding to changes when working with clients during the consultation and testing process — in outcome 2
- initiative: independent thinking; motivation; self-belief; responsibility in preparing for working with a client, and more specifically, during the consultation and testing process — in outcomes 1, 2, and 4

Social intelligence

This meta-skill includes:

- communicating: receiving information; giving information; listening to others when working with clients, either on a one-to-one basis or in groups — in outcomes 1, 2, and 4
- feeling: sense of responsibility; empathy; understanding how others feel when working with clients; developing an understanding of when to show empathy; developing the ability to build relationships; working with clients and planning around their needs; accepting the perspectives of others to understand their feelings and motivations — in outcomes 1, 2, and 4
- collaborating: operating in different settings; building relationships with clients; working towards shared goals; and team working with other professionals — in outcomes 1 and 2
- leading: inspiring and motivating others; influencing others and being a role model; developing others when working with clients — in outcomes 1, 2 and 4

Innovation

This meta-skill includes:

- curiosity: noticing significant information; asking questions; information sourcing; problem recognition — in outcomes 1, 2, 3, 4 and 6
- creativity: creating enjoyable programmes and sessions for clients; responding to different situations and adapting; coming up with solutions to problems when working with clients and groups — in outcome 3

- sense-making: analysing client information gained from the consultation and testing process; analysing client programme data and making sense of constant changes when working with clients — in outcomes 1, 2 and 3
- critical thinking: analysing client information gained from the consultation and testing process; analysing client programme data; and making sense of constant changes when working with clients — in outcomes 1, 2 and 3

Delivery of unit

This is a mandatory unit in the NextGen HND Physical Activity and Health. It is a 2-credit unit, 16 SCQF credits at SCQF level 8.

We recommend that 80 hours are contact time, and 80 hours are self-directed learning. However, the amount of time you allocate to each outcome is at your centre's discretion. We recommend that you integrate delivery of the unit with Exercise Practitioner 2 (SCQF level 8).

Principles of Training for Personal Trainers (SCQF level 8) includes:

- gathering client information, such as client screening PAR-Qs
- a client 7-day nutrition diary
- health and performance testing
- planning a 12-week programme; development and practical delivery of various training methods
- biomechanics of human movement and develops an understanding of the effects of exercise on the body systems

The screening and planning aspects for working with clients provides the planning basis for the practical delivery assessments in Exercise Practitioner 2 (SCQF level 8).

Learners can use evidence from both units as part of a portfolio or e-portfolio.

Learners must choose a client group from the list below to complete outcomes associated with working with a client or clients:

- sedentary
- recovering from an injury
- over-trained
- high-level performer
- sport-specific performer
- clients with low-risk health conditions

You should use learning and teaching approaches that are varied and appropriate to the aims of the unit.

Professional recognition

For learners to achieve the Professional Development Award (PDA) in Personal Training (SCQF level 8), you must teach this unit in conjunction with Exercise Practitioner 2 (3-credit unit).

Learners who complete both units are eligible to become a member of the Chartered Institute of Management of Sport and Physical Activity (CIMSPA) as a Personal Trainer Practitioner.

Additional guidance

You should use learning and teaching approaches that are varied and appropriate to the aims of the unit.

Approaches to assessment

There are opportunities for cross-assessment and/or holistic assessment across the mandatory units in the HND in Physical Activity and Health. Any practical activity used to generate evidence should reflect the knowledge and skills identified in the evidence requirements for each outcome. Centres should refer to the Educator Guide for guidance and support notes.

Using a range of assessment methods helps learners to develop different skills that are transferable to work or further and higher education.

We recommend you assess outcomes 1, 2 and 3 holistically using a project.

Conduct and analyse a lifestyle management consultation for a client (outcome 1); and Conduct and analyse a range of health and performance-based fitness tests to establish a client's baseline measurements (outcome 2)

We recommend learners:

- develop a consultation document that allows them to record all the essential personal and medical information detailed in the 'Knowledge and skills' section
- choose health and performance-based fitness tests that are:
  - appropriate to their client's capabilities
  - linked to their client's goals and components of fitness detailed in the training intervention

Examples of methods for conducting basic postural analysis on a client:

- photographic analysis
- visual observation
- postural grid
- goniometers
- flexi ruler
- photogrammetry
- radiographic
- electromagnetic tracking device

Examples of standardised tests for each of the fitness components:

- power:
  - vertical jump
  - standing long jump
  - standing triple jump
  - force plate data
- flexibility:
  - hamstring extension
  - modified sit-and-reach
  - Thomas Test
  - use of goniometry in flexibility testing
  - functional movement screening (FMS) protocols
  - Y Balance Test
- strength:
  - 1 to 5 repetition maximum
  - isokinetic tests
  - dynamometer tests
- anaerobic endurance:
  - line drill
  - jam test
  - repeated sprint test
  - phosphate decrement test
- aerobic endurance:
  - multi-stage fitness test
  - Cooper 12-minute run test
  - Yo-Yo test
  - direct VO2 max tests
  - onset of blood lactate accumulation value (OBLA)
  - maximal lactate steady state (MLSS) test
- speed and agility:
  - 5 to 40 metres sprint
  - T-Test
  - agility tests
  - change of direction tests (COD): the 505 or modified versions

Examples for measuring body composition:

- callipers
- body mass
- height
- measuring tape
- bioelectrical impedance analysis equipment

After testing, learners should analyse results against available norms and/or data and offer appropriate feedback to the client. They should record results in a portfolio and use them in the development of the client's training programme.

We recommend you collect project evidence holistically for outcomes 1, 2 and 3.

Develop an individual training intervention for a client (outcome 3)

Learners can show all the knowledge and skills required by applying the training principles and training guidelines through the development process of a 12-week training programme for an individual and/or group.

We recommend learners use the health-related and skill-related components of fitness in their programme planning.

Learners must include monitoring and re-test strategies that help guide progress.

Develop a range of fitness-based exercise techniques (outcome 4)

Learners must:

- show their knowledge of planning, for a range of fitness exercise techniques, by producing an appropriate planning document
- practically demonstrate a range of fitness methods

The range of fitness methods required to be covered are:

- cardiovascular exercise: for example, steady state, interval, fartlek
- resistance exercise: for example, a range of training systems, exercise equipment, fixed and free weight
- functional exercise: for example, movement patterns, muscle actions and components of fitness which mirror a client's functional requirements
- flexibility exercise: including static, ballistic, dynamic and proprioceptive neuromuscular techniques (including the myotactic/stretch reflex) to facilitate increased range of motion

We recommend you assess this outcome under open-book conditions.

Analyse the effects of exercise on the body systems and discuss the interaction between exercise prescription and effective application as a personal trainer (outcome 5)

You can deliver aspects of this outcome in a practical or gym environment. We recommend you assess this outcome using a test containing multiple-choice, short response and/or extended-response questions.

We recommend you assess this outcome under closed-book conditions.

Critically analyse the biomechanics of human movement (kinesiology) and apply effectively during exercise delivery (outcome 6)

You can deliver aspects of this outcome in a practical or gym environment. You can deliver as a stand-alone unit, or with the unit Exercise Practitioner 2 (SCQF Level 8).

We recommend you assess this outcome:

- holistically, using a case study of the client training programme, ensuring all evidence requirements are covered
- by a presentation

In all written work, learners should include a declaration of validity that the content is their own work, unless cited otherwise. Learners should sign and date their submissions. We recommend you encourage learners to submit their evidence digitally, through your centre's virtual learning environment (VLE), using antiplagiarism software.

Opportunities for e-assessment

Assessment that is supported by information and communication technology (ICT), such as e-testing or the use of e-portfolios or social software, may be appropriate for some assessments in this unit.

If you want to use e-assessment, you must ensure that you apply the national standard to all evidence and that conditions of assessment (as provided in the evidence requirements) are met, regardless of the mode of gathering evidence.

Equality and inclusion

This unit is designed to be as fair and as accessible as possible with no unnecessary barriers to learning or assessment.

You should take into account the needs of individual learners when planning learning experiences, selecting assessment methods or considering alternative evidence.

Guidance on assessment arrangements for disabled learners and/or those with additional support needs is available on the assessment arrangements web page: www.sqa.org.uk/assessmentarrangements.

Information for learners

Training Principles for Personal Trainers (SCQF level 8)

This information explains:

- what the unit is about
- what you should know or be able to do before you start
- what you need to do during the unit
- opportunities for further learning and employment

Unit information

This unit develops your knowledge and understanding of the planning processes involved in providing personal training support to different client groups. It develops your practical skills as you carry out client consultations and physical assessments with a specified client group.

You choose a minimum of one client from these client groups:

- sedentary
- recovering from injury
- over-trained
- high-level performer
- sport-specific performer
- clients with low-risk health conditions

You further develop your knowledge and apply your skills as you carry out training interventions with clients. You also develop your knowledge and understanding of anatomy, physiology, and applied biomechanics, and how to apply them.

Once you complete the unit, you are able to carry out a comprehensive consultation process with a client, while also providing an analysis of the collected personal information around medical, lifestyle, exercise history and nutritional factors.

You choose appropriate health and performance-based fitness tests that are appropriate to your clients' capabilities and link to their goals and the components of fitness chosen to be developed in the training intervention.

After collating all of your client’s information, you show all the necessary knowledge and skills as you apply the training principles and training guidelines to developing a 12-week training programme for an individual or group.

You show your knowledge of planning for a range of fitness exercise techniques by producing an appropriate planning document, covering the following fitness methods:

- cardiovascular exercise, for example:
  - steady state
  - interval
  - fartlek
- resistance exercise, for example:
  - a range of training systems
  - exercise equipment
  - fixed and free weight
- functional exercise, for example:
  - movement patterns
  - muscle actions and components of fitness that mirror a client's functional requirements
- flexibility exercise, including:
  - static
  - ballistic
  - dynamic and proprioceptive neuromuscular techniques, including the myotactic/stretch reflex, to facilitate increased range of motion

You show your practical skills by demonstrating the range of fitness methods stated.

As you teach and/or coach, you critically analyse the biomechanics of human movement (kinesiology) and apply your knowledge effectively during exercise delivery. You also learn to analyse the effects of exercise on the body systems and how to discuss the interaction between exercise prescription and effective application as a personal trainer.
Outcomes 1, 2, 3, 4 and 6, are assessed holistically under open-book conditions — for example, by an overall unit project. You can gather evidence for these outcomes in a portfolio.

Outcome 5 is assessed under closed-book conditions.

Meta-skills

Throughout the unit, you develop meta-skills to enhance your employability in the creative industries sector.

Meta-skills include self-management, social intelligence and innovation.

Self-management — achieved in outcomes 1, 2, 3 and 4

This meta-skill includes developing the ability to focus. You sort information into categories and understand the relationship between the various categories of information. You develop your adaptability as you refine your ability to critically reflect on new knowledge and experiences, gaining a deeper understanding and embedding and extending your learning.

The unit supports your ability to make decisions and employ a considered choice after appropriately using intuition and careful thought.

Social intelligence — achieved in outcomes 1, 2 and 4

This develops your communication skills by developing your ability to receive, understand and process verbal or written communication. You develop your collaboration skills by applying your knowledge and understanding as you work with clients. You can build relationships when supporting and educating your client. You identify and initiate connections, developing mutual benefit.

Innovation — achieved in outcomes 1, 2, 3 and 4

The unit encourages curiosity, critical thinking and creativity by asking questions, researching, generating ideas, visualising, problem solving, and engaging with and understanding industry practice. You develop your sense-making skills through the process of organising, manipulating, pruning and filtering gathered data into cohesive structures for information-building.

Professional recognition

If you complete this unit alongside the Exercise Practitioner 2 unit, you achieve the Professional Development Award (PDA) in Personal Training (SCQF level 8) and become eligible to join the Chartered Institute for the Management of Sport and Physical Activity (CIMSPA) as a qualified Personal Trainer Practitioner.

Administrative information

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Superclass: MD

History of changes

Version	Description of change	Date
2.0	Updated 'Entry requirements' for learners undertaking the unit as a stand-alone PDA.	June 2024

Note: please check SQA's website to ensure you are using the most up-to-date version of this document.