YMCA Level 2 and Level 3 Technical Occupational Entry Diplomas in Exercise and Fitness

YMCA Level 2 Technical Specialist Awards in Exercise and Fitness

Operational start date: 01/08/2025

Qualification Specification

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YMCA Level 2 Extended Technical Occupational Entry in Exercise and Fitness: Gym Instructor (Diploma) (610/4592/5)

YMCA Level 3 Technical Occupational Entry in Exercise and Fitness: Personal Trainer (Diploma) (610/3995/0)

YMCA Level 2 Technical Specialist in Exercise and Fitness: Group Exercise Instructor (Circuit Training) (Award) (610/4600/0)

YMCA Level 2 Technical Specialist in Exercise and Fitness: Group Exercise Instructor (Indoor Cycling) (Award) (610/4601/2)

Qualification Specification

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Introduction

Y Awards Ltd, has a long and respected history as the first UK awarding organisation to specialise in health and fitness qualifications, launching in 1998 as CYQ.

We are experts in education, health and wellbeing, with over 25 years of experience developing UK-regulated and globally recognised qualifications.

We work closely with industry experts, employers, and training providers to make sure that our products and services deliver life-changing opportunities. With over half a million qualifications awarded, 400,000 people have advanced their career with Y Awards Ltd.

Aims: Technical occupational entry qualifications

Our Level 2 Technical Occupational Entry qualifications are designed to:

- Enable learners to acquire the knowledge, skills and behaviours relevant to developing competence in an occupation.
- Provide employers with reliable evidence of a learner's attainment against occupational standard KSBs, which form the minimum requirements for entry into occupation.
- Support learners to demonstrate transferable employability skills, which underpin technical competence.
- Differentiate learner achievement to support employment, progression and employer selection decisions (where identified as required).
- Form part of a (re)engaging, flexible course of learning and act as motivation for learners to enter and progress within the occupational area.

Our Level 3 Technical Occupational Entry qualifications are designed to:

- Enable learners to acquire the knowledge, skills and behaviours relevant to developing competence in an occupation.
- Provide employers with reliable evidence of a learner's attainment against occupational standard KSBs, which form the minimum requirements for entry into an occupation.
- Differentiate learner achievement to support employment, progression and employer selection decisions (where identified as required).
- Form part of an engaging course of learning and act as motivation for learners to progress within the occupational area.

- Provide opportunities for learners to build their confidence during their course of study to develop their own unique voice and communication style, preparing them for employment within the fitness sector.

YMCA Level 2 Extended Technical Occupational Entry in Exercise and Fitness: Gym Instructor (Diploma) (610/4592/5)

By completing this qualification, learners will meet:

- Skills England approved outcomes for gym instructing (Linked to occupational standard for Leisure Team Member OCC0390)
- The industry requirements to become a gym instructor, as set out within the CIMSPA gym instructor professional standard.

The purpose of this qualification is to enable learners to:

- Maintain health, safety and hygiene in the gym-based environment.
- Supervise and support clients in a gym-based environment.
- Plan, deliver and evaluate gym-based exercise programmes.

YMCA Level 3 Technical Occupational Entry in Exercise and Fitness: Personal Trainer (Diploma) (610/3995/0)

By completing this qualification, existing gym instructors can expand their scope of practice to deliver personal training. This qualification meets:

- Skills England approved outcomes for gym instructing (Linked to occupational standard for Personal Trainer OCC0302).
- The industry requirements to become a personal training, as set out within the CIMSPA Personal Trainer professional standard.

The purpose of this qualification is to enable learners to:

- consult and assess clients' needs and support them towards their health and fitness goals
- plan, deliver and evaluate indoor and outdoor personal training sessions to support individuals (one-to-one) and small groups
- apply methods of marketing and promoting their own personal training business.

Aims: Technical specialist qualifications

Our technical specialist qualifications are designed to:

- Provide learners with knowledge, skills and behaviours relevant to developing additional specialist competence in an occupation.
- Provide employers with reliable evidence of learners' attainment against occupational outcomes which form the minimum requirements for practice in a specialised role within the occupational area.
- Differentiate learner achievement to support employment, progression and employer selection decisions (where identified as required).
- Form part of an engaging course of learning and act as motivation for learners to specialise within the occupational area.

YMCA Level 2 Technical Specialist in Exercise and Fitness: Group Exercise Instructor (Circuit Training) (Award) (610/4600/0)

By completing this qualification, learners will meet:

- Industry requirements to become a group exercise instructor, as set out within the CIMSPA Core Group Exercise Instructor professional standard.
- Skills England specialised fitness instruction duties for instructing circuit sessions.

The purpose of each qualification is to enable learners to plan, deliver and evaluate group circuit training sessions with six or more participants.

YMCA Level 2 Technical Specialist in Exercise and Fitness: Group Exercise Instructor (Indoor Cycling) (Award) (610/4601/2)

By completing this qualification, learners will meet:

- Industry requirements to become a group exercise instructor, as set out within the CIMSPA Core Group Exercise Instructor professional standard.
- Skills England specialised fitness instruction duties for instructing studio cycling.

The purpose of each qualification is to enable learners to plan, deliver and evaluate group indoor cycling sessions with six or more participants.

Progression opportunities

The qualifications within this qualification specification include occupational entry and technical specialists. This means they meet the agreed industry prerequisites to enter the sport and physical activity sector as an employed or self-employed gym instructor, group exercise instructor and/or personal trainer, depending on the qualification completed.

These qualifications can also lead to further training at the same and/or higher levels to specialise and increase scope of practice. For example:

- **Population specialisms** (to work with a broader range of clients):
    - YMCA Level 2 Award in Engaging Inactive People in Physical Activity to Create Long-Term Behaviour Change (603/7345/3)
    - YMCA Level 2 Award in Engaging Children Aged 0-5 in Sport and Physical Activity (603/7218/7)
    - YMCA Level 2 Award in Engaging Children and Young People in Sport and Physical Activity (603/7216/3)
    - YMCA Level 3 Award in Supporting Participation in Physical Activity: Perinatal (610/0829/1)
    - YMCA Level 3 Award in Supporting Participation in Physical Activity: Disability and Impairments (610/1559/1)
    - YMCA Level 3 Award in Supporting Participation in Physical Activity: Older Adults (610/1668/8)
    - YMCA Level 3 Diploma in Exercise Referral (603/3103/3)
- **Environment specialisms** (to work in more settings):
    - YMCA Level 2 Award in Developing Sustainable Physical Activity Programmes Within Community Settings (603/7343/X)
- **Technical specialisms** (to work with specific equipment or perform additional roles within the workplace):
    - YMCA Level 2 Award in Instructing Kettlebell Training (603/7186/9)
    - YMCA Level 2 Award in Instructing Suspended Movement Training (603/7187/0)
    - YMCA Level 2 Award in Mental Health Awareness and Understanding Approaches to Support Individuals (603/7146/8)
    - YMCA Level 2 Award in Safeguarding Adults and Adults at Risk (610/0822/9)
    - YMCA Level 3 Award in Emergency First Aid at Work (603/1902/1)
    - YMCA Level 3 Award in First Aid at Work (603/1903/3)

Stakeholder engagement

These qualifications are mapped and approved against standards and duties outlined by the organisations listed below:

- Chartered Institute for the Management of Sport and Physical Activity (CIMSPA)
- Skills England
- Association for Nutrition (AfN).

YMCA Level 2 Extended Technical Occupational Entry in Exercise and Fitness

Pathway	CIMSPA professional standard(s)
Gym Instructor (Diploma) (610/4592/5)	• Skills England Leisure Team Member occupational standard • CIMSPA Gym Instructor professional standard

YMCA Level 3 Technical Occupational Entry Diploma in Exercise and Fitness

Pathway	CIMSPA professional standard(s)
Personal Trainer (610/3995/0)	• Skills England Personal Trainer occupational standard • CIMSPA Personal Trainer professional standard • AfN competence framework: Nutrition for Fitness and Leisure (Intermediate Level)

YMCA Level 2 Technical Specialist in Exercise and Fitness

Pathway	CIMSPA professional standard(s)
Group Exercise Instructor (**Circuit Training**) (Award) (610/4600/0)	• Skills England specialised fitness instructing duties (Instructing Circuit Sessions) • CIMSPA Core Group Exercise Instructor professional standard
Group Exercise Instructor (**Indoor Cycling**) (Award) (610/4601/2)	• Skills England specialised fitness instructing duties (Instructing Studio Cycling) • CIMSPA Core Group Exercise Instructor professional standard

Availability

Learners can take these qualifications in:

Location	Regulated by
England	Ofqual
Wales	Not currently available
Northern Ireland	Not currently available
Other UK regions and outside of the UK	Not currently available

Entry requirements and prerequisites

YMCA Level 2 Extended Technical Occupational Entry in Exercise and Fitness

Pathway	Entry requirements and prerequisites
Gym Instructor (Diploma) (610/4592/5)	Learners must be aged 16 at the point of certification.

YMCA Level 3 Technical Occupational Entry Diploma in Exercise and Fitness

Pathway	CIMSPA professional standard(s)
Personal Trainer (610/3995/0)	Learners must have completed a qualification or apprenticeship endorsed against the CIMSPA Gym Instructor professional standard.

YMCA Level 2 Technical Specialist in Exercise and Fitness

Pathway	CIMSPA professional standard(s)
Group Exercise Instructor (**Circuit Training**) (Award) (610/4600/0)	Learners must have completed a qualification or apprenticeship endorsed against one of the following CIMSPA professional standards: • Gym Instructor • Core Group Exercise Instructor
Group Exercise Instructor (**Indoor Cycling**) (Award) (610/4601/2)	

Reasonable adjustments and special consideration

In making these qualifications available, Y Awards Ltd has made every attempt to make sure that there are no unnecessary barriers to achievement. You can find full details of our reasonable adjustment and special consideration policy on our website.

ymcaawards.co.uk/centres/policies-and-procedures

Grading and structure

These qualifications are graded Pass or Refer.

A Pass grade demonstrates that a learner has been assessed as fully competent against all assessment criteria within the qualification.

A Refer indicates that a learner has been assessed as not yet competent against one or more of the assessment criteria of the unit and/or qualification. This is a failing grade, and learners will require reassessment to achieve the qualification.

To achieve a Pass, learners must achieve the components indicated below:

YMCA Level 2 Extended Technical Occupational Entry in Exercise and Fitness

Pathway	Group requirements and prerequisites
Gym Instructor (Diploma) (610/4592/5)	**Group A:** level 2 unit **Group B**: all units **Group C:** all units **Prerequisites**: none required

YMCA Level 3 Technical Occupational Entry Diploma in Exercise and Fitness

Pathway	Group requirements and prerequisites
Personal Trainer (610/3995/0)	**Group A:** level 3 unit **Group E**: all units **Prerequisites:** knowledge and skills covered in Group B and C units

YMCA Level 2 Technical Specialist in Exercise and Fitness

Pathway	Group requirements and prerequisites
Group Exercise Instructor (**Circuit Training**) (Award) (610/4600/0)	**Group D:** Plan, deliver and evaluate group circuit training (F/650/4860) **Prerequisites:** Knowledge and skills covered in Group A, and B
Group Exercise Instructor (**Indoor Cycling**) (Award) (610/4601/2)	**Group D:** Plan, deliver and evaluate group indoor cycling (Y/650/7422) **Prerequisites:** Knowledge and skills covered in Group A, and B

Group A: Anatomy and Physiology

Learners completing this group must achieve one unit:

- Learners completing a **Level 2 qualification** must achieve the Fundamentals of anatomy and physiology for exercise and fitness professionals (H/650/7417).
- Learners completing a **Level 3 qualification** must achieve Anatomy and physiology for exercise and fitness professionals (H/650/4852).

UN	Unit title	Level	GLH
H/650/7417	Fundamentals of anatomy and physiology for exercise and fitness professionals	2	74
H/650/4852	Anatomy and physiology for exercise and fitness professionals	3	107

Group B: Underpinning knowledge

Learners completing this group must achieve all units.

UN	Unit title	Level	GLH
J/650/4853	Providing a positive customer experience to exercise and fitness participants	2	24
K/650/4854	Principles of physical activity, exercise and training approaches to develop fitness and health	2	23
L/650/4855	Health screening, risk stratification and scope of practice	3	13
R/650/4857	Health awareness and lifestyle management	2	25

Group C: Gym Instructing

Learners completing this group must achieve all units.

UN	Unit title	Level	GLH
T/650/4858	Supporting clients in a gym-based environment	2	17
Y/650/4859	Plan, deliver and evaluate gym-based training	2	26

Group D: Group Exercise Instructing (Technical Specialism)

Learners completing this group must achieve one unit relevant to their specialism.

UN	Unit title	Level	GLH
F/650/4860	Plan, deliver and evaluate group circuit training	2	27
Y/650/7422	Plan, deliver and evaluate group indoor cycling	2	27

Group E: Personal Training

Learners completing this group must achieve all units.

UN	Unit title	Level	GLH
F/650/6219	Nutrition for physical activity and exercise	3	49
K/650/4863	Consultation and assessment for personal training	3	40
M/650/4865	Plan, deliver and evaluate personal training	3	60
J/650/4862	Plan, deliver and evaluate outdoor training	3	23
F/650/7416	Business acumen for health and fitness professionals	3	26

Guided learning hours and total qualification time

The tables below show the Guided Learning Hours (GLH) and Total Qualification Time (TQT) for each qualification. Find out more about GLH and TQT on our website:

ymcaawards.co.uk/qualifications/glh-and-tqt

YMCA Level 2 Extended Technical Occupational Entry in Exercise and Fitness

Pathway	GLH	TQT
Gym Instructor (Diploma) (610/4592/5)	202	393

YMCA Level 3 Technical Occupational Entry Diploma in Exercise and Fitness

Pathway	GLH	TQT
Personal Trainer (610/3995/0)	305	499

YMCA Level 2 Technical Specialist in Exercise and Fitness

Pathway	GLH	TQT
Group Exercise Instructor **(Circuit Training)** (Award) (610/4600/0)	27	54
Group Exercise Instructor **(Indoor Cycling)** (Award) (610/4601/2)	27	54

Assessment overview

These qualifications are designed to be assessed in line with the client jouney, with learners demonstrating the knowledge, skills and behaviours outlined in one stage before proceeding to the next.

Recognition of prior learning (RPL) can be accepted for learners who hold existing qualifications endorsed against the CIMSPA professional standards, national occupational standards, or European standards, e.g.

- Register of Exercise Professionals (REPs) / SkillsActive
- European Register of Exercise Professionals (EREPs) / EuropeActive

Assessment may be required to check currency of knowledge for qualifications achieved over five years ago.

YMCA Level 2 Extended Technical Occupational Entry in Exercise and Fitness

Pathway (QN)	1.1	2.1	2.2	3.1	3.2	4.1	4.2	5.1	5.2	5.3	5.4	5.5	5.6
Gym Instructor (Diploma) (610/4592/5)	x	x	x	x	x	N/A							

YMCA Level 3 Technical Occupational Entry Diploma in Exercise and Fitness

Pathway (QN)	1.1	2.1	2.2	3.1	3.2	4.1	4.2	5.1	5.2	5.3	5.4	5.5	5.6
Personal Trainer (610/3995/0)	Prerequisite					N/A		x	x	x	x	x	x

YMCA Level 2 Technical Specialist in Exercise and Fitness

Pathway (QN)	1.1	2.1	2.2	3.1	3.2	4.1	4.2	5.1	5.2	5.3	5.4	5.5	5.6
Group Exercise Instructor (**Circuit Training**) (Award) (610/4600/0)	Prerequisite					d	d	N/A					
Group Exercise Instructor (**Indoor Cycling**) (Award) (610/4601/2)	Prerequisite					e	e	N/A					

The table below provides details of the assessment tasks.

Assessment task	Details	Unit(s) assessed
1.1 Health screening and risk stratification case studies with professional discussion	Learners are provided with the following scenario: "You have just started to promote your own exercise and fitness business and have recently advertised that you are offering a variety of exercise and fitness sessions in the local area. A range of individuals (see case study briefs) have contacted you, asking: • for information on the sessions you are delivering • whether it would be appropriate for them to attend any of the sessions • which sessions you would recommend." Learners will be provided with three case studies (either Set 1, Set 2, or Set 3) to review. Learners will apply their knowledge of health screening and risk stratification to decide each individual's suitability and readiness to participate in their session(s). Learners may use their class notes and conduct independent research using evidence-based, reputable information sources to support their judgements. This assessment is split into two parts: **1. Applied case study questions** Learners will complete the applied case study questions template provided within the Learner Assessment Record (LAR). **2. Professional discussion** Once the assessor has confirmed that the applied case study questions template has been completed to the required standard, learners will	Fundamentals of anatomy and physiology for exercise and fitness professionals (H/650/7417) **AND** Health screening, risk stratification and scope of practice (L/650/4855) **AND** Health awareness and lifestyle management (R/650/4857)

Assessment task	Details	Unit(s) assessed

	undertake a 25 minute (±10%) professional discussion with their assessor.
	
	The aim of the professional discussion is to authenticate learners' work and confirm learners' knowledge, understanding and application of health screening and risk stratification regarding the case studies they were issued.
	
	The professional discussion will take place within two weeks of the applied case study questions being marked.
	
	Learners may refer to their applied case study template during the professional discussion. No other notes are permitted.
	
	The assessor will ask one broad, overarching question to start the professional discussion and up to eight open-ended questions relating to the underpinning knowledge listed below.
	
	Underpinning knowledge and understanding
	
	During this assessment, learners will be assessed on their underpinning knowledge of the following subjects:
	
	• Anatomy and physiology:
	  ○ blood pressure classifications
	  ○ structure and function of the endocrine system
	  ○ the function of main structures in the digestive process
	  ○ lifespan changes which affect the body system, health and wellbeing.	

Assessment task	Details	Unit(s) assessed

	• Health awareness and lifestyle management:
	  ○ components of a healthy lifestyle and factors that affect health and wellbeing
	  ○ principles of nutrition and healthy eating
	  ○ a range of health conditions and medically-controlled diseases influenced by lifestyle
	  ○ psychological and social factors influencing lifestyle and behaviour change.
	• Health screening, risk stratification and scope of practice:
	  ○ the role of health screening and risk stratification prior to exercise
	  ○ screening tools
	  ○ exercise contraindications
	  ○ scope of practice.	

2.1 Inducting individual clients and small groups to specific exercises and equipment in the gym environment with professional discussion	Learners will demonstrate their skills inducting individuals and small groups of clients to specific exercises and equipment in the gym environment. Learners are required to demonstrate their knowledge and understanding of health and safety and safeguarding as part of each demonstration, including supervising client/clients at all times and identifying/carrying out any relevant cleaning activities. This assessment is split into two parts: **1. Health and safety**	Fundamentals of anatomy and physiology for exercise and fitness professionals (H/650/7417) **AND** Providing a positive customer experience to exercise and fitness participants (J/650/4853) **AND**

Assessment task	Details	Unit(s) assessed
	Learners must fully complete the following records: • An induction overview, including verbal screening and copies of physical activity readiness questionnaire (PAR-Q+) and informed consent forms used (for real clients/participants only). • A risk assessment. **2. Inducting individual clients and small groups** Learners will introduce individuals and small groups of clients to the gym environment, including: • A minimum of one gym supervision/walk around, including demonstration of gym etiquette. • A minimum of one cleaning activity. • Use of an appropriate teaching sequence – e.g. N.A.M.S.E.T or I.D.E.A. – to induct client(s) to exercises, including how to: ○ set-up and use resistance machines ○ set-up and use cardiovascular machines ○ set-up and perform free weight exercises, including: – safe lifting, passing and spotting free-weight equipment ○ demonstrate bodyweight exercises. Learners must demonstrate one exercise from each row of the designated exercises list within the *Induction evidence log* (see the LAR). During demonstrations learners must:	Supporting clients in a gym-based environment (T/650/4858)

Assessment task	Details	Unit(s) assessed
	○ use the correct anatomical terminology, e.g. anterior, posterior ○ name and locate specific muscles and joint actions ○ identify correct spine and joint alignment ○ provide appropriate teaching points ○ adapt instructional and communication skills according to the client(s) needs. Evidence for walk arounds/tours, should take three minutes (± 20%) each. Evidence for resistance, cardiovascular, free weight and bodyweight exercises should take between one minute and 1 minute 30 seconds (75 seconds, ± 20%) each. This means the total duration for this task should be between 40 and 60 minutes. **3. Professional discussion** Once the assessor has confirmed that the induction evidence has been completed to the required standard, learners will undertake a professional discussion of 25 minutes (±10%). The professional discussion will take place within two weeks of this. The aim of this professional discussion is to assess any requirements which may not have been evidenced fully and to verify the authenticity of the learner's work. This may include topics covered within the underpinning knowledge and understanding requirement, outlined below. The assessor will ask one broad, overarching question to start the professional discussion and up to eight open-ended questions relating to the underpinning knowledge outlined below.	

Assessment task	Details	Unit(s) assessed

	The professional discussion will be within two weeks of the submission of your induction evidence records.
	
	Learners may refer to their induction evidence records when answering these questions. No other notes are permitted.
	
	Underpinning knowledge and understanding
	
	During this assessment, learners will also be assessed on their underpinning knowledge of the following subjects:
	
	• Anatomy and physiology:
	  ○ anatomical terms and planes of movement
	  ○ skeletal system
	  ○ muscular system.
	• Supporting clients in a gym-based environment.
	• Providing a positive customer experience to exercise and fitness participants, including:
	  ○ the customer experience, respecting equality and diversity
	  ○ health and safety and safeguarding
	  ○ business processes and uses of IT.	

2.2 Gym consultation and assessment, with professional discussion	Learners will be required to conduct a face-to-face consultation (including administering a minimum of two health assessments) with a real client. During their consultation, they must obtain sufficient information to establish the client's SMART goals.	Health screening, risk stratification and scope of practice (L/650/4855) **AND** Supporting clients in a gym-based environment (T/650/4858)

Assessment task	Details	Unit(s) assessed

	The information gathered during the consultation will be required for the learner to complete Assessment 2.3 Plan a gym-based exercise session.
	
	The information gathering will comprise:
	
	• **Consultation,** which should be obtained via:
	  ○ a client consultation
	  ○ completion of a PAR-Q+.
	• **Health tests,** where two health tests will be completed.
	
	The consultation and assessment should last between 30 and 45 minutes.
	
	Learners should capture notes during the consultation/assessment in the supplied *Gym consultation and assessment record* and then write up, in full sentences, immediately afterwards, where required. Learners should ensure they keep all rough working within the template as their assessor will use this alongside their observation/any video evidence to confirm the authenticity of the learner's work.
	
	Note: The consultation must be observed by an assessor. The submission of pre-recorded video evidence is permitted for this.
	
	2. Professional discussion
	
	Once the assessor has confirmed that the consultation and assessment evidence has been completed to the required standard, learners will undertake a professional discussion of 20 minutes (±10%).
	
	The aim of this professional discussion is to assess any requirements which may not have been evidenced fully and to verify the authenticity of
		AND
		
		Providing a positive customer experience to exercise and fitness participants (J/650/4853)

Assessment task	Details	Unit(s) assessed

	the learner's work. This may include topics covered within the underpinning knowledge and understanding requirement, outlined below.
	
	The assessor will ask one broad overarching question and up to six open-ended questions to cover the underpinning knowledge requirements listed below.
	
	Underpinning knowledge and understanding
	
	During this assessment, learners will also be assessed on their underpinning knowledge of the following subjects:
	
	• supporting clients in a gym-based environment
	• providing a positive customer experience in an exercise and fitness environment:
	  ○ customer experience
	  ○ continuing professional development business processes and IT.	

3.1 Plan a gym-based exercise session, with professional discussion	This assessment is split into two parts: **1. Planning** Learners are required to plan for a gym-based exercise session for the client with whom you conducted the consultation and assessment in assessment task 2.2. Learners must complete the following: • a session overview • a risk assessment • session plan:	Fundamentals of anatomy and physiology for exercise and fitness professionals (H/650/7417) **AND** Principles of physical activity, exercise and training approaches to develop fitness and health (K/650/4854) **AND**

Assessment task	Details	Unit(s) assessed
	○ a suitable warm-up, including: – mobility (joint actions) – pulse raising activities/exercises – range of motion stretching • Cardiovascular training component, including: ○ identifying the training approach and timings. • A combination of resistance machines, free weights and bodyweight exercise to support the needs of the client, including: ○ identifying the muscle/muscles being used for each exercise ○ resistance, reps, sets and rest periods, as appropriate. • A suitable cooldown and flexibility component, including: ○ rewarm/pulse lowering activity ○ post workout stretches, including a minimum of four maintenance stretches and a minimum of one developmental stretch. All exercises selected are the learner's choice and should provide a balanced whole body training approach, covering all components of fitness. The plan will be centre assessed by an assessor using the checklists provided by Y Awards Ltd.	Plan, deliver and evaluate gym-based training (Y/650/4859)

Assessment task	Details	Unit(s) assessed
	2. Professional discussion Once the assessor has confirmed that the planning records meet the required standard, learners will undertake a professional discussion of 25 minutes (±10%). The aim of this professional discussion is to assess any requirements which may not have been evidenced fully and to verify the authenticity of the learner's work. This may include topics covered within the underpinning knowledge and understanding requirement, outlined below. The assessor will ask one broad, overarching question and up to eight open-ended questions. The professional discussion will be within two weeks of the submission of the gym-based exercise programme. Learners may refer to their session planning records when answering these questions. **Underpinning knowledge and understanding** During this assessment, assessors will take the opportunity to establish the learner's underpinning knowledge of the following subjects: • Principles of physical activity, exercise, and training approaches to develop fitness and health. • Anatomy and physiology: o cardiovascular system o respiratory system	

Assessment task	Details	Unit(s) assessed
	○ nervous system ○ energy systems ○ effects of exercise on the body systems.	
3.2 Deliver and evaluate a gym-based exercise session	**1. Session delivery and evaluation** Learners will demonstrate the skills required of a gym instructor when working with an individual client, using the session plan submitted in assessment task 3.1. Following the observed session, learners will complete an evaluation of the session (time allowed 30 minutes). The gym-based exercise session must incorporate relevant exercises and equipment. However, they must be appropriate for the client/participant and should provide a balanced training approach, covering all components of fitness.	Plan, deliver and evaluate gym-based training (Y/650/4859)
4.1d Plan a group exercise session (circuit training)	This assessment is split into two parts: **1. Planning** Learners are required to plan for a group exercise session within the context of their qualification/unit. Learners must complete the following: • a session overview • a risk assessment • session plan: ○ a suitable warm-up, including:	Plan, deliver and evaluate group circuit training (F/650/4860)
4.1e Plan a group exercise session (indoor cycling		Plan, deliver and evaluate group indoor cycling (Y/650/7422)

Assessment task	Details	Unit(s) assessed
	– mobility (joint actions) – pulse raising activities/exercises – range of motion stretching • main workout component, including: ○ cardiovascular training component, including: – identifying the training approach and timings ○ resistance exercises and equipment (where appropriate): – identifying the muscle/muscles being used for each exercise – resistance, reps, sets and rest periods, as appropriate. • A suitable cooldown and flexibility component, including: ○ rewarm/pulse lowering activity ○ post workout stretches, including a minimum of four maintenance stretches and a minimum of one developmental stretch. All exercises selected are the learner's choice and should provide a balanced whole body training approach, covering all components of fitness. The plan will be centre assessed by an assessor using the checklists provided by Y Awards Ltd. **2. Professional discussion** Once the assessor has confirmed that the learner's group exercise programme meets the required standard, the learner will undertake a professional discussion of 10 minutes (±10%). This may include topics	

Assessment task	Details	Unit(s) assessed
	covered within the underpinning knowledge and understanding requirement, outlined below. The aim of this professional discussion is to assess any requirements of the assessment which may not have been evidenced fully and to verify the authenticity of the learner's work. The assessor will ask one broad, overarching question and a maximum of three open-ended questions to cover the underpinning knowledge requirements listed below. The professional discussion will be within two weeks of the submission of the group exercise programme. Learners may refer to their planning records when answering these questions. **Underpinning knowledge and understanding** During this assessment, assessors will take the opportunity to establish the learner's underpinning knowledge of the following subjects: • planning group exercise.	

Assessment task	Details	Unit(s) assessed
4.2d Deliver and evaluate a group exercise session (circuit training)	**1. Session delivery** Learners will demonstrate the skills required of a group exercise instructor – in the context of their qualification/unit – when working with a group of clients, using the session plan submitted in assessment task 4.1. Following the observed session, learners will complete an evaluation of the session (time allowed 30 minutes). The group exercise session must incorporate relevant exercises and equipment. However, they must be appropriate for the participants and should provide a balanced training approach, covering all components of fitness.	Plan, deliver and evaluate group circuit training (F/650/4860)
4.2e Deliver and evaluate a group exercise session (indoor cycling)		Plan, deliver and evaluate group indoor cycling (Y/650/7422)

5.1 Consultation assessment and professional discussion	This assessment is split into two parts:
	1.Consultation and assessment
	Learners will conduct a face-to-face consultation/assessment with a real client, during which they must obtain sufficient information to establish the client's SMART goals. This consultation should last between 45 and 60 minutes.
	This information gathering task will comprise two parts:
	• **Subjective information**, which should be obtained via:
	  ○ a client consultation.
	  ○ completion of a PAR-Q+.
		Anatomy and physiology for exercise and fitness professionals (H/650/4852)
		AND
		Nutrition for physical activity and exercise (F/650/6219)
		AND
		Consultation and assessment for personal training (K/650/4863)

Assessment task	Details	Unit(s) assessed

	• **Objective information**, which should be obtained using a minimum of:
	  ○ Two health tests
	  ○ Posture analysis (anterior, posterior and lateral)
	  ○ One static/dynamic fitness assessment.
	Learners must capture notes during the consultation/assessment in the supplied *Client consultation and assessment record card* and then write up in full sentences immediately afterwards, where required.
	The completed *Client consultation and assessment record card* should be submitted to the assessor within 24 hours of the assessment taking place.
	Learners must ensure they keep all rough working within the template as the assessor will use this alongside their observation/any video evidence to confirm the authenticity of their work.
	This session should conclude with the learner providing their client with a blank food diary template, guidance for its use, and instruction that they provide a completed version of it before or during Assessment 5.3 (training log).
	2. Professional discussion
	Once the assessor has confirmed that the learner's *Client consultation and assessment record card* meets the required standard, the learner will undertake a professional discussion of 25 minutes (±10%).
	The professional discussion will be within two weeks of confirmation that the learner's '*Client consultation and assessment record card* meets the required standard.	

Assessment task	Details	Unit(s) assessed
	The professional discussion will comprise one broad, overarching question and up to nine open-ended questions asked by the assessor to: • assess any requirements of the assessment which may not have been evidenced fully • verify the authenticity of the learner's work • address the underpinning knowledge requirements listed below. The additional questions must be taken from the question bank provided by Y Awards Ltd. Learners may refer to their completed client record card during the professional discussion. No other notes are permitted. **Underpinning knowledge and understanding** During this assessment the assessor will also take the opportunity to establish the learner's underpinning knowledge of the following subjects: **Consultation and assessment for personal training** • working with other health care professionals. **Anatomy and skeletal system:** • terms of location • bone classification, structure, major bones, and skeletal functions. **Joints and movement:** • joint classification and structure of freely movable joints.	

Assessment task	Details	Unit(s) assessed
	Spine • structure, function, normal and abnormal curvatures. **Body systems:** • cardiovascular, respiratory and endocrine system structure and functions. **Bone development and lifespan changes:** • stages of bone growth, repair and lifespan effects on body systems. **Short-term effects of exercise**: • impact on the musculoskeletal, circulatory, respiratory and response systems.	
5.2. Design of a progressive exercise programme, first session plan and professional discussion	Once the learner has gathered sufficient information from their client (see Assessment 5.1: Consultation/assessment), they are required to design a progressive exercise programme appropriate for their aims and goals and current abilities. This assessment is split into three parts: **1. Progressive exercise programme** This progressive exercise programme must:	Anatomy and physiology for exercise and fitness professionals (H/650/4852) **AND** Plan, deliver and evaluate personal training (M/650/4865) **AND**

Assessment task	Details	Unit(s) assessed
	• Span a timeframe of a sufficient duration to 'show improvements in the client's lifestyle, health, and fitness' (recommended 12 weeks). • Incorporate warm-up and cooldown activities appropriate to the session/client. • Provide an overview of how each component of fitness will be addressed during the programme. • Include different modes of exercise. • Incorporate a range of fitness training techniques. • Show how the programme will progress over time. • Include sessions designed for different environments of which at least one must be for outdoors (other suitable environments include gym, studio/sports hall, community facility, client's home or other confined space, etc.). **2. First session plan template** Once the learner has created their progressive exercise programme, they are required to populate the *First session plan template*. On completion, they must send this, together with the progressive exercise programme, to their assessor for approval. The assessor will provide feedback to the learner regarding the progressive exercise programme template and first session plan template within two weeks of submission.	Plan, deliver and evaluate outdoor training (J/650/4862)

Assessment task	Details	Unit(s) assessed
	3. Professional discussion Once the assessor has confirmed that the learner's progressive plan and first session plan template meet the required standard, the learner will undertake a professional discussion of 40 minutes (±10%). The professional discussion will be within two weeks of confirmation that the progressive plan and first session plan template meet the required standard. The professional discussion will comprise one broad, overarching question and up to 12 open-ended questions asked by the assessor to: • assess any requirements of the assessment which may not have been evidenced fully • verify the authenticity of the learner's work • address the underpinning knowledge requirements listed below. The additional questions must be taken from the question bank provided by Y Awards Ltd. Learners may refer to their progressive plan and first session plan template when answering these questions. **Underpinning knowledge and understanding** During this assessment the assessor will also take the opportunity to establish the learner's underpinning knowledge of the following subjects: **Movement and musculoskeletal system:** • planes of movement and joint functions	

Assessment task	Details	Unit(s) assessed
	• major skeletal muscles, actions, and roles • types of muscular contraction and muscle fibre characteristics • structure and function of skeletal and pelvic floor muscles • principles of muscular contraction. **Nervous system:** • structure, divisions, and functions of the nervous system • nerve structure, impulses and roles of motor units, proprioceptors, muscle spindles, and Golgi tendon organs. **Cardiovascular and respiratory systems:** • cardiovascular system structure and blood flow • respiratory system structure, breathing control and gaseous exchange. **Digestive system and energy production** • digestive system structure, function and process • energy systems and ATP resynthesis. **Planning a personal training programme/session:** • how to monitor and review a client's progress. **Outdoor training:** • how environmental features can be used to adapt and progress exercises.	

Assessment task	Details	Unit(s) assessed
	Small group • How to balance the needs of the individual and the group	
5.3. Implementation of a progressive exercise programme with client and professional discussion	Once the learner has designed a progressive exercise programme and planned the first session, they will begin implementing the programme with their client. This assessment is split into two parts: **1. Training log** Learners will implement the progressive exercise programme they designed for their client in Assessment 5.2 and record evidence of this in the *Training log*. Learners must update their *Training record* after each session and provide a summary of changes to their assessor each week. The assessor will request evidence from the training log for sampling so they can provide feedback on personal training skills, in preparation for Assessments 5.4 and 5.5. The completed training log must contain: • The progressive exercise programme the learner created as part of Assessment 5.2. • A record of each training session the learner has planned and completed with their client, including at least one outdoor session. • Any feedback the learner receives from their client during the programme.	Anatomy and physiology for exercise and fitness professionals (H/650/4852) **AND** Nutrition for physical activity and exercise (F/650/6219) **AND** Plan, deliver and evaluate personal training (M/650/4865) **AND** Plan, deliver and evaluate outdoor training (J/650/4862)

Assessment task	Details	Unit(s) assessed

	• Any modifications the learner makes to any session plans and/or the overall progressive exercise programme.
	• Client progress reports.
	• Nutrition case study, containing:
	  ○ a completed seven-day food diary from the client (see assessment 5.2)
	  ○ nutritional analysis (including dietary goals)
	  ○ video evidence of healthy eating and dietary recommendations given to the client: this discussion should be 10 minutes (± 10%).
	• Video evidence of a complete component from:
	  ○ the first session
	  ○ a session from the second phase of the progressive plan
	  ○ a session from the third phase of the progressive plan.
	Across these three sessions, learners must include evidence of:
	  ○ one complete warm-up component
	  ○ two complete main sessions, including one outdoor and one indoor
	  ○ one complete cooldown component
	  ○ three examples of feedback given to client(s) on their progress toward their goals.	

Assessment task	Details	Unit(s) assessed
	As component length will vary between sessions, the assessor will sample video evidence of completed components, reviewing: ○ five minutes (± 10%) for warm-up and cooldown components ○ 10 minutes (± 10%) for each main session ○ five minutes (± 10%) for feedback to each of the three client(s). • Feedback received from the assessor about learner progress. The assessor will provide timely, constructive feedback confirming the learner's achievements and development points. **2. Professional discussion** Once the assessor has confirmed that the learner's completed training log meets the required standard, they will undertake a professional discussion of 25 minutes (±10%). The professional discussion will be within two weeks of confirmation that the progressive plan and first session plan template meet the required standard. The professional discussion will comprise one broad, overarching question and up to eight open-ended questions asked by the assessor to: • assess any requirements of the assessment which may not have been evidenced fully • verify the authenticity of the learner's work • address the underpinning knowledge requirements listed below.	

Assessment task	Details	Unit(s) assessed
	The learner may refer to their training log evidence when answering these questions. **Underpinning knowledge and understanding** During this assessment the assessor will also take the opportunity to establish the learner's underpinning knowledge of the following: **Digestive system and energy production:** • function and structure of the digestive system • digestive process • role of energy systems in ATP resynthesis. **Blood sugar and carbohydrates:** • glycaemic index and blood sugar regulation • simple versus complex carbohydrates • role of glycogen in energy storage • dietary strategies for blood sugar maintenance. **Cholesterol and health risks:** • role of cholesterol in the body • risks of high cholesterol levels. **Nutrition and health:**	

Assessment task	Details	Unit(s) assessed
	• relationship between nutrition, physical activity, body composition and health • groups at risk of overnutrition and undernutrition • risks and limitations of weight loss and fad diets • impact of portion sizes on nutrient and energy intake • effects of food preparation and cooking on nutrition • health risks of excess alcohol. **Safe dietary practices:** • limits of safe practice in recommending dietary supplements and performance aids.	

Assessment task	Details	Unit(s) assessed
5.4 Demonstration of personal training skills (1:1)	Once the learner has gathered sufficient evidence of their personal training skills within their Training Log (Assessment Task 5.3), they may progress to the final assessment of their practical skills. The assessor will confirm when they have successfully met the requirements of Assessment Task 5.3 and are ready to progress to: • Assessment Task 5.4 – One-to-one practical assessment, and • Assessment Task 5.5 – Small group practical assessment. The date and time for each practical assessment to take place will be agreed by the assessor, ~~l~~ Learner and client(s) These assessments may take place in either order. The learner will demonstrate the skills required of a personal trainer when working with an individual, using a session plan of their choice taken from the training log. **Individual (participant)** This person should be the same person the learner designed the progressive exercise programme for and has been training. However, should they be unavailable, then another suitable person may be used. Ideally, they should not be a peer. **Environment** The environment should be the same as that for which the training was designed.	Plan, deliver and evaluate personal training (M/650/4865) **AND** Plan, deliver and evaluate outdoor training (J/650/4862)

Assessment task	Details	Unit(s) assessed
5.5 Demonstration of personal training skills (small group)	Once the learner has gathered sufficient evidence of their personal training skills within their Training Log (Assessment Task 5.3), they may progress to the final assessment of their practical skills. The assessor will confirm when they have successfully met the requirements of Assessment Task 5.3 and are ready to progress to: • Assessment Task 5.4 – One-to-one practical assessment, and • Assessment Task 5.5 – Small group practical assessment. The date and time for each practical assessment to take place will be agreed by the assessor, ~~-~~ ~~l~~Learner and client(s) These assessments may take place in either order. Learners will demonstrate the skills required of a personal trainer when working with a small group. They can use a session plan of their choice taken from their training log. Using the selected session plan, the learner must modify and adapt it to enable it to meet the needs of a small group of participants with varying abilities, goals, and levels of experience. This must include: • Additional / modifications made to safety considerations • Planned methods to ensure individual participant needs are balanced with the overall needs of this group. • Adaptations to instructional and communication skills to support and manage this group.	Plan, deliver and evaluate personal training (M/650/4865) **AND** Plan, deliver and evaluate outdoor training (J/650/4862)

Assessment task	Details	Unit(s) assessed
	• Modifications made to the design of the selected one to one session, including appropriate progressions and regressions to accommodate differing participant abilities. Once approved the learner must deliver this adapted session **Small group requirements** This should be between three and five participants, one of whom is ideally the client from the training log. However, should they be unavailable, then another suitable person may be used. Ideally, they should not be a peer (see additional information client requirements). **Environment** The environment should be the same as that for which the training was designed.	
5.6 Showcase presentation and professional discussion	Once the learner has successfully demonstrated their competence in delivering one-to-one and small group personal training sessions, they will complete the showcase presentation and professional discussion. The assessor must confirm that the learner has met the requirements for Assessments 5.4 and 5.5 before they can complete Assessment 5.6. This assessment is split into two parts.	Consultation and assessment for personal training (K/650/4863) **AND** Plan, deliver and evaluate personal training (M/650/4865) **AND**

Assessment task	Details	Unit(s) assessed
	Learners are required to pre-record delivery of a presentation which showcases: • their experiences and lessons learned during the period of implementing their progressive exercise plan • improvements in the client's lifestyle, health and fitness • how they plan to market and grow their business. The presentation must be 10 minutes (± 10%) and include: **1. Review and evaluation of the learning and assessment journey, including:** • Details of their client: o background (training history, etc.) o their goals/aims/motivational factors/barriers. • How the learner supported their client towards the achievement of their physiological goals: o description of the programme (content, frequency, environment, etc.) and how its effectiveness was monitored o reviews, feedback and any modifications made to the programme o how the learner provided appropriate information and/or signposting (when necessary). • Strategies the learner used to influence both short- and long-term behaviour change in their client(s).	Plan, deliver and evaluate outdoor training (J/650/4862) **AND** Business acumen for health and fitness professionals (F/650/7416)

Assessment task	Details	Unit(s) assessed

	• Evaluation (What worked well? What challenges did they face? What would they do differently with future clients?):
	  ○ pre-planning, i.e. the reason for their choice of health tests, static/dynamic fitness assessments during Assessment 5.1
	  ○ programme, e.g. how effective does the learner think it was?
	  ○ client (including feedback received)
	  ○ self (lessons learned, what changes the learner would make, etc.).
	2. Plans for the learner's personal training business:
	• An overview of the business, including:
	  ○ goals
	  ○ local demographics/facilities available, etc.
	  ○ target markets
	  ○ main competitors
	  ○ SWOT or PESTLE analysis.
	• An overview of the learner's products/services, including:
	  ○ how they relate to their scope of practice
	  ○ how they differ from competitors
	  ○ how they meet the needs and expectations of different demographics.	

Assessment task	Details	Unit(s) assessed

	• Plans for developing the learner's business, including:
	  ○ marketing and promotion plans
	  ○ strategies to:
	  - gain new clients
	  - retain existing clients.
	Professional discussion:
	Following submission of the presentation, the learner will undertake a professional discussion of 10 minutes (±10%).
	The professional discussion will be within two weeks of confirmation that the assessor has reviewed all of the presentation evidence.
	The aim of this professional discussion is to assess any requirements of the assessment which may not have been evidenced fully and to verify the authenticity of the learner's work.
	The assessor will ask one broad, overarching question and up to three open-ended questions to cover the underpinning knowledge requirements listed below.
	Learners may refer to their presentation and completed learner assessment record when answering these questions.
	Underpinning knowledge and understanding
	During this assessment the assessor will also take the opportunity to establish the learner's underpinning knowledge of the following:
	• Anatomy and physiology:	

Assessment task	Details	Unit(s) assessed
	○ long-term effects of exercise. • Business acumen: ○ stages of the sales cycle ○ legal and regulatory requirements for different types of businesses. .	

Due to the synoptic nature of some assessment tasks, learners may generate evidence across multiple units within a single task. However, the minimum requirements for assessment are outlined below in the non-shaded boxes.

Unit (UN)	1.1	2.1	2.2	3.1	3.2	4.1	4.2	5.1	5.2	5.3	5.4	5.5	5.6
Group A: Anatomy and Physiology													
Fundamentals of anatomy and physiology for exercise and fitness professionals (H/650/7417)	x	x		x									
Anatomy and physiology for exercise and fitness professionals (H/650/4852)								x	x	x			
Group B: Underpinning knowledge													
Providing a positive customer experience to exercise and fitness participants (J/650/4853)		x	x										
Principles of physical activity, exercise and training approaches to develop fitness and health (K/650/4854)				x									
Health screening, risk stratification and scope of practice (L/650/4855)	x		x										
Health awareness and lifestyle management (R/650/4857)	x												
Group C: Gym Instructing													
Supporting clients in a gym-based environment (T/650/4858)		x	x										
Plan, deliver and evaluate gym-based training (Y/650/4859)				x	x								

Unit (UN)	1.1	2.1	2.2	3.1	3.2	4.1	4.2	5.1	5.2	5.3	5.4	5.5	5.6
Group D: Group Exercise Instructing (Technical Specialism)													
Plan, deliver and evaluate group circuit training (F/650/4860)						d	d						
Plan, deliver and evaluate group indoor cycling (Y/650/7422)						e	e						
Group E: Personal Training													
Nutrition for physical activity and exercise (F/650/6219)								x	x	x			
Consultation and assessment for personal training (K/650/4863)								x					x
Plan, deliver and evaluate personal training (M/650/4865)									x	x	x	x	x
Plan, deliver and evaluate outdoor training (J/650/4862)									x	x	x	x	x
Business acumen for health and fitness professionals (F/650/7416)													x

Using this document

The following pages provide the unit content for this qualification. Each unit includes learning outcomes, assessment criteria and relevant content for delivery. These are set out below.

Learning outcome ('the learner will')	
Assessment criteria ('the learner can') What a learner is expected to know, understand or be able to do following their learning.	**Relevant content** (additional delivery guidance) Suggestions on depth and breadth of content to cover. Learners may not be assessed against all the relevant content identified.

At the end of each unit, the assessment specification outlines how we expect to measure or confirm the learner has met the standard set in the learning outcomes and assessment criteria.

Qualification content

Group A: Anatomy and Physiology

Fundamentals of anatomy and physiology for exercise and fitness professionals (H/650/7417)

Unit aim

To provide the essential foundation knowledge of the structure and function of the body systems relevant to exercise and fitness instruction.

Learners will be able to apply their knowledge to support the planning of safe and effective exercise sessions.

Content

1. Understand anatomical terminology	
1.1 Identify terms of location	Definition of terms and anatomical examples of: • superior and inferior • anterior and posterior • medial and lateral • proximal and distal • superficial and deep.
1.2 Identify planes of movement	• Three planes which divide the body. • Joint actions and exercise examples in each plane: o frontal (coronal) plane: – passes from side to side at right angles to the sagittal plane – divides the body into front and back sections – related terminology – anterior and posterior – joint actions include abduction and adduction – exercise examples include side leg lifts (abduction), lateral raises, jumping jacks. o Sagittal vertical plane: – passes from front to rear, dividing the body into two symmetrical halves: left and right – joint actions include flexion and extension

	– exercise examples include knee raises, leg curls, walking, running, forward lunge, biceps curl and bench press. ○ Transverse: – any horizontal plane of the body that is parallel to the diaphragm – divides the body into upper and lower – joint actions include rotation, pronation and supination. – exercise examples – spine rotations, oblique curls/crunches, twisting movements such as boxing jabs.

2. Understand the classification, structure and function of the skeletal system	
2.1 Summarise the classification (types) of bones	• Function and examples of each type of bone. • Bones classified by their shape and function: ○ long – femur ○ short – tarsals ○ flat – scapula ○ sesamoid – patella ○ irregular – vertebrae.
2.2 Outline the structure of bones	• Different types of bone tissue: ○ compact and spongy/cancellous tissue. • Long bone structure: ○ articular cartilage at ends of bones (where joints are formed) ○ epiphysis ○ diaphysis ○ periosteum ○ epiphyseal plates (growth plates) ○ medullary cavity ○ hyaline cartilage ○ compact bone ○ cancellous bone ○ yellow and red bone marrow.

2.3 Name and locate major bones:
• axial
• appendicular
	• Axial:
	  ○ cranium
	  ○ cervical vertebrae
	  ○ thoracic vertebrae
	  ○ lumbar vertebrae
	  ○ sacral vertebrae
	  ○ coccyx
	  ○ sternum
	  ○ ribs.
	• Appendicular:
	  ○ scapula
	  ○ clavicle
	  ○ humerus
	  ○ ulna
	  ○ radius
	  ○ carpals
	  ○ metacarpals
	  ○ phalanges
	  ○ ilium
	  ○ ischium
	  ○ pubis
	  ○ femur
	  ○ patella
	  ○ tibia
	  ○ fibula
	  ○ tarsals
	  ○ metatarsals.

2.4 Outline the structure and function of the spine	Structure of the vertebral column: • Regions – cervical, thoracic, lumbar, sacral and coccygeal. • The number of vertebrae in each spinal section. • Four natural curves (two kyphotic, two lordotic). • Function of curves. • The roles that lordotic and kyphotic curves play in posture and achieving a ‘neutral spine’. • Potential ranges of movement in different spinal regions, including joint actions.

2.5 Outline abnormal degrees of curvature of the spine and their implications for exercise	• Curvatures that deviate from optimal posture/alignment and their implications on movement:
	  ○ scoliosis
	  ○ hyper lordosis
	  ○ hyper kyphosis
	  ○ flat back
	  ○ sway back.
	• Factors that may contribute to sub-optimal spinal curvatures:
	  ○ muscle imbalances
	  ○ genetic conditions
	  ○ lifestyle factors
	  ○ medical conditions
	  ○ pregnancy.

2.6 Describe the functions of the skeleton	Functions and examples: • Muscle attachments and levers – muscles attach to bones (levers) and exert a force to pull on the bones to create movement at joints (fulcrum). • Protection of internal organs, e.g. brain is protected by cranium, heart and lungs are protected by the rib cage. • Production of red and white blood cells in the bone marrow. • Skeletal framework provides body shape and a foundation structure. • Storage of calcium and other minerals.

2.7 Summarise the stages of bone development, growth and repair	• Process of bone growth – ossification.
	• Stages of bone growth – from foetal, birth, through to adolescence and older age.
	• Remodelling process:
	  ○ the roles of osteoblasts, osteoclasts and osteocytes
	  ○ the role of calcium, vitamin D and hormones.
	• Ageing/lifespan process – when bones stop growing in length, when bones lose calcium, including the effects of menstrual cycle and menopause, osteopenia/osteoporosis.
	• Factors that affect growth:
	  ○ exercise – weight bearing
	  ○ age
	  ○ lifestyle factors – smoking, nutrition, alcohol, etc.
	  ○ sunlight
	  ○ hereditary factors.

2.8 Summarise the classification of joints	Examples of different classifications and differences in function and movement potential: • fibrous – immoveable • cartilaginous – slightly moveable • synovial – freely moveable.
2.9 Outline the structure of freely movable joints: • types • ligaments	• Structure of a synovial joint – joint capsule, synovial membrane, synovial fluid, ligaments, tendons and cartilage (hyaline and fibrocartilage). • Types – hinge, saddle, gliding, pivot, condyloid, ball and socket. • Structural differences of different types of joint and how this affects movement potential. • Function of ligaments: non-elastic, prevent/limit unwanted movement, attach bone to bone, joint stability. • Function of tendons. • Function of cartilage.

2.10 Describe the function of joints:
• joint actions at specific joints
• related planes of movement
• mobility
• stability
	• The movement potential at different types of synovial joint (see types within 2.9 above).
	• Joint actions available at specific joints:
	  ○ flexion and extension, e.g. knee
	  ○ adduction and abduction, e.g. hip
	  ○ rotation, e.g. between axis and atlas
	  ○ circumduction, e.g. shoulder
	  ○ horizontal flexion and horizontal extension, e.g. shoulder
	  ○ elevation and depression, e.g. shoulder girdle
	  ○ lateral flexion and lateral extension, e.g. spine
	  ○ pronation and supination, e.g. forearm – radioulnar joint
	  ○ plantar flexion and dorsi flexion, e.g. ankle
	  ○ protraction and retraction, e.g. shoulder girdle.
	  ○ inversion and eversion.
	• Movement planes in which different joint actions happen:
	  ○ frontal (coronal), sagittal and transverse planes.
	• Factors affecting joint mobility and stability:
	  ○ structure – see different types of joint
	  ○ location, e.g. hip and shoulder different functions
	  ○ flexibility of surrounding tissues (laxity of ligaments)
	  ○ injury (damage to articular surfaces).

3. Understand the classification, structure and function of the muscular system	

3.1 Summarise the types and properties of muscle tissue	Different types of tissue, properties and examples:
	• Skeletal – striated:
	  ○ voluntary – conscious control, controlled by somatic nervous system, found in consciously controlled skeletal muscles.
	• Smooth:
	  ○ involuntary – unconscious control, controlled by autonomic nervous system, found in structures not under conscious control, e.g. blood vessels, digestive system.
	• Cardiac – heart:
	  ○ involuntary – striated, unconscious control, initiated by the sinoatrial node (SA node).

3.2 Summarise the structure of skeletal muscles	• Structure:
	  ○ muscle comprises (or consists of, made up from) water (70%), protein (23%), minerals and substrates (7%):
	  – fascia
	  – connective tissue
	  – muscle fibres
	  – fasciculi
	  – epimysium
	  – endomysium
	  – perimysium
	  – myofibrils
	  – myofilaments
	  – sarcomeres
	  – actin and myosin
	  – mitochondria (cells) and their role.
	  ○ muscle attachments (and examples):
	  – aponeurosis
	  – direct to bone
	  – muscles cross joints, attach to bones via tendons.

3.3 Describe skeletal muscle fibre types and their characteristics	• Different types of muscle fibres and characteristics:
	  ○ slow twitch type I - slow oxidative
	  ○ fast twitch type 2a (intermediate) – fast oxidative glycolytic
	  ○ fast twitch type 2b – fast glycolytic.
	• Relationships with:
	  ○ energy systems – aerobic and anaerobic
	  ○ different types of training.
	• Factors that influence fibre type:
	  ○ genetics
	  ○ ageing
	  ○ types of exercise.

3.4 Name and locate the major skeletal muscles:
• upper
• lower
• anterior
• posterior
	Location of:
	• Shoulder girdle:
	  ○ pectoralis major
	  ○ trapezius
	  ○ rhomboids.
	• Arms and shoulders
	  ○ biceps
	  ○ triceps
	  ○ deltoids.
	• Back:
	  ○ latissimus dorsi
	  ○ erector spinae.
	• Pelvic girdle and hip:
	  ○ hip flexors (iliopsoas)
	  ○ gluteals
	  ○ adductors
	  ○ abductors.
	• Legs:
	  ○ quadriceps
	  ○ hamstrings
	  ○ tibialis anterior
	  ○ gastrocnemius
	  ○ soleus.

	• Abdominals:
	  ○ internal and external obliques
	  ○ transversus abdominus
	  ○ rectus abdominus.

3.5 Outline the joint actions produced by major skeletal muscles: • upper • lower • anterior • posterior	• Related function and joint action produced by concentric and eccentric contraction of specific muscles. • See 2.10 and 3.4.

3.6 Describe the roles of skeletal muscles	• Roles – agonists (prime movers), antagonists, synergists, fixators:
	  ○ examples in relation to exercises and movements.
	• Functions and properties of muscles:
	  ○ contract to create movement or assist in the stabilisation of joints.
	  ○ generate heat (shivering).
	  ○ keep the body upright by resisting the force of gravity:
	  – posture.

3.7 Describe the process/principles of muscular contraction	Interrelationship with nervous system:
	• All or none law.
	• Sliding filament theory, the role of actin and myosin, the role of ATP, motor neuron impulses, motor unit recruitment.
	• Stretch (myotatic) reflex and inverse stretch reflex.
	• Size principle of motor unit recruitment.
	• Other principles of muscle work (biomechanics and kinesiology):
	  ○ muscles only pull (apply force) on bones (levers), they cannot push, contract in direction of fibres
	  ○ cross joints (fulcrum) and create movement
	  ○ work in pairs/groups
	  ○ muscles roles (see previous points).

3.8 Outline the types of muscular contraction	• Types of contraction:
	  ○ concentric and eccentric (isotonic)
	  ○ isometric
	• the effects of gravity on muscle work and the effects of fixed resistance/pulley equipment on muscle work.
	• advantages and disadvantages of isotonic/isometric movement in relation to everyday activity, activity for health and within an exercise and fitness session, to include:
	  ○ causes and effects of delayed onset muscle soreness (DOMS)
	  ○ Valsalva effect; functionality and effects on blood pressure.

3.9 Outline the structure and function of the pelvic floor muscles	• Structure:
	  ○ deep and superficial layers
	  ○ fast and slow-twitch muscle fibres
	  ○ muscle attachments.
	• Function:
	  ○ stability for the pelvic girdle
	  ○ support for organs and growing foetus during pregnancy
	  ○ controlling continence
	  ○ as lower part of inner cylinder – stability (along with diaphragm, abdominals, back muscles)
	  ○ counteract changes in abdominal pressure.

4. Understand the classification, structure and function of the cardiovascular system	

4.1 Summarise the structures of the cardiovascular system	• Heart – myocardium (cardio):
	  ○ muscular pump
	  ○ two halves – right (deoxygenated blood) and left (oxygenated blood)
	  ○ four chambers – right and left ventricles, right and left atria
	  ○ valves (prevent back flow) – bicuspid, tricuspid, aortic, pulmonary.
	• Blood vessels (vascular):
	  ○ comprise: arteries, arterioles (smaller versions of arteries) veins, venules (smaller versions of veins) and capillaries (smallest of the blood vessels):

	– capillaries: ▪ are the smallest blood vessels (one blood cell thick) – veins: ▪ carry blood towards the heart at low pressure ▪ deoxygenated blood in all except the pulmonary veins ▪ have thinner, less muscular walls ▪ have a series of one-way (non-return) valves to prevent backflow of blood and require the assistance of skeletal muscle to help venous return ▪ the vena cava has two branches (inferior and superior) and returns blood from the body back to the right atrium ▪ the pulmonary veins return blood back to the left atrium – arteries: ▪ carry blood away from the heart at high pressure ▪ oxygenated blood in all arteries except the pulmonary arteries ▪ are pressurised and have thick, smooth, muscular walls ▪ the aorta is the largest/major artery that carries blood from the left ventricle to the body ▪ the pulmonary arteries carry blood from the right ventricle to the lungs.
4.2 Describe the function of the cardiovascular system	• Location/size of the heart: o behind the sternum, just to the left of centre o size of a clenched fist. • Functions: o circulation of: – blood (deoxygenated/oxygenated) and nutrients, hormones, medications. • Terminology – definitions of: o stroke volume – the amount of blood pumped in one beat o cardiac output – the amount of blood pumped in one minute

	○ heart rate – beats per minute, pulse monitoring points, e.g. radial artery. • The effects of exercise on the above.
4.3 Outline the flow of blood around the systemic and pulmonary systems	• Systemic circulation – flow around heart and body: ○ from heart to body – aorta, arteries, arterioles, capillaries: – gaseous exchange at muscular levels (mitochondria) ○ from body to heart – venules, veins, superior/inferior vena cava, right atrium (systemic). • Pulmonary circulation – flow around heart and lungs: ○ from lungs to heart – pulmonary vein, left atrium, left ventricle (pulmonary) ○ from heart to lungs – right ventricle, pulmonary artery: – gaseous exchange in lungs. • Interrelationship with respiratory system and muscular system – gaseous exchange.
4.4. Outline blood pressure: • classifications • systolic/diastolic	The body's need for blood pressure. Definitions: • Blood pressure is a measure of force in the artery walls. • Systolic blood pressure: ○ the pressure in the arteries (contracting/pumping phase). • Diastolic blood pressure: ○ the pressure in the arteries (resting/filling phase). Classifications: • Systolic and diastolic readings: ○ optimal, normal blood pressure classifications ○ hypotension, pre-hypertension and hypertension (different stages). • Current and up-to-date guidelines regarding blood pressure detailed from the following bodies: ○ World Health Organization (WHO) ○ National Institute for Health and Care Excellence (NICE) ○ American College of Sports Medicine (ACSM). • Effects of exercise on blood pressure: ○ linear increase ○ issues when working with hypertensive clients ○ when exercise is contraindicated.

5. Understand the classification, structure and function of the respiratory system	

5.1 Summarise the structure of the respiratory system	Respiratory tract – upper and lower:
	• Upper:
	  ○ nose and mouth
	  ○ pharynx
	  ○ larynx.
	• Lower:
	  ○ trachea (windpipe)
	  ○ lungs:
	  – bronchus (bronchi)
	  – bronchioles
	  – alveolus (alveoli) (capillaries) and location of gaseous exchange.
	How the alveoli and capillaries link the respiratory and cardiovascular systems.

5.2 Outline the function of the respiratory system	• The position of the lungs within the thoracic cavity
	• Function:
	  ○ intake of oxygen
	  ○ removal of carbon dioxide
	  ○ gaseous exchange
	  ○ diffusion: the movement of molecules from an area of greater concentration to an area of lesser concentration.
	• The passage of air through respiratory tract during inhalation (inspiration) and exhalation (expiration):
	  ○ nose and mouth
	  ○ pharynx
	  ○ larynx
	  ○ trachea
	  ○ bronchi
	  ○ bronchioles
	  ○ alveoli.
	• Terminology:
	  ○ external respiration – the exchange of gases between the lungs and the blood
	  ○ internal respiration – the exchange of gases between the blood and the cells of the body

	○ The process of respiration: – take in air from the atmosphere – inhalation/inspiration – gaseous exchange alveoli – pass oxygen into the circulatory system – remove carbon dioxide from the circulatory system via exhalation. ○ Composition of air during: – inhalation – exhalation. ○ Average respiratory rate – 12-20 breaths per minute: – factors affecting respiratory rate and efficiency: ▪ exercise ▪ stress ▪ age ▪ chronic health problems.
5.3 Outline the mechanism and control of breathing	• Respiration is controlled by the respiratory centre located in the brain. • The function and location of each muscle involved in inhalation and exhalation. • Natural breathing: ○ intercostals (internal and external): – inspiration externals contract and lift the ribs up – expiration externals relax and the ribs lower ○ diaphragm: – inspiration contracts and descends – expiration relaxes and ascends.
5.4 Outline the process of gaseous exchange	• Gaseous exchange of oxygen and carbon dioxide in the body. • The role of the alveoli and capillaries in gaseous exchange: ○ oxygen (alveoli) moves from the lungs to the bloodstream (capillaries) ○ carbon dioxide passes from the blood (capillaries) to the lungs (alveoli) to be exhaled. • The process of the diffusion of gases from areas of high concentration to areas of low concentration.

6. Understand the classification, structure and function of the nervous system	

6.1 Summarise the structure and divisions of the nervous system	Main divisions:
	• Central nervous system (CNS):
	  ○ the brain and spinal cord.
	• Peripheral nervous system (PNS):
	  ○ motor and sensory nerves that branch out from the spinal cord.
	• PNS is divided into:
	  ○ somatic nervous system
	  ○ autonomic nervous system (ANS)
	  ○ two sub-divisions of autonomic nervous system (ANS:
	  – sympathetic (speeds up processes)
	  – parasympathetic (slows down processes).

6.2 Describe the functions of the nervous system	• Communication and control system of body. • Works collaboratively with the endocrine system. • Maintains homeostasis. • Three key roles: 1. Sensory – detects changes in the body's internal environment and gathers information about the external environment. 2. Interpretation – analyses and interprets the changes sensed and selects the appropriate response. 3. Motor output – responds to the changes by signalling the required action, e.g. the secretion of hormones from the endocrine glands, or by initiating muscle contraction.

6.3 Outline the role of each subdivision of the peripheral nervous system:
• somatic
• autonomic
	• Somatic nervous system:
	  ○ voluntary muscle actions.
	• Autonomic nervous system:
	  ○ involuntary actions such as digestion and/or control of blood pressure, etc.
	  ○ two divisions of autonomic nervous system (ANS):
	  – sympathetic (fight or flight, war) – speed up
	  – parasympathetic (rest and digest, peace) – slow down.

6.4 Outline the structure of nerves	• Structure:
	  ○ axons
	  ○ dendrites
	  ○ cell body
	  ○ nucleus
	  ○ myelin sheath.

6.5 Outline the process of a nerve impulse	• Interrelationship with the muscular system:
	  ○ how nerve impulses are conducted
	  ○ the role of ATP
	  ○ the 'all or none' law
	  ○ motor neuron impulses, motor unit recruitment.

6.6 Outline the function of:
• motor units
• proprioceptors
• muscle spindles
• Golgi tendon organs
	• Motor unit comprises one motor nerve and all the muscle fibres it causes to contract:
	  ○ the number of these muscle fibres can vary from one or two to 1000:
	  – a stimulus must be strong enough to trigger an action potential to pass down the motor neuron
	  – all muscle fibres within a single motor unit will be maximally innervated by the action potential, or none will
	  – the size principle of motor unit recruitment: motor units are recruited in order of size, from small to large.
	• Proprioceptor is a sensory organ which receives stimuli from within the body to give detailed and continuous information about the position of the limbs and other body parts.
	• Muscle spindle is a proprioceptor located within the body of a skeletal muscle that primarily detects changes in the length of the muscle.
	• Golgi tendon organ (GTO) is a proprioceptor located within a tendon that detects how much tension is being transferred into the muscle.
	• Interrelationship of proprioceptors with exercise:
	  ○ stretching (lengthening) – PNF and developmental stretching
	  ○ muscle contraction – the more motor units activated, the greater the strength of contraction.

7. Understand the classification, structure and function of the endocrine system

7.1 Summarise the structure of the endocrine system:

- major glands
- hormones

Structure:

- comprised of several glands that produce and secrete hormones:

Gland	Hormone (to include)	Action/role (to include)
Adrenal	Epinephrine (adrenaline) Norepinephrine (noradrenaline)	Initiates stress response – fight or flight
Pancreas	Insulin	Lowers blood sugar levels
	Glucagon	Raises blood sugar levels
Ovaries	Oestrogen	Female 'characteristics' Breast development
	Progesterone	Menstrual cycle/egg production Promote fat storage
Testes	Testosterone	Male 'characteristics' include increased muscle, bone mass, and the growth of body hair

8. Understand the structure and function of the digestive system

8.1 Describe the function of the digestive system

- Breakdown of food into nutrients such as carbohydrates, fats and proteins so they can be absorbed into the bloodstream for energy, growth and repair.

8.2 Summarise the function of each of the main structures within the digestive system	Digestive system structures:
	• Mouth (tongue, teeth, salivary glands):
	  ○ mastication (mechanical breakdown of food, i.e. chewing)
	  ○ moistening (softening of food with saliva)
	  ○ salivary amylase breaks down carbohydrates.
	• Pharynx (throat):
	  ○ permits the passage of swallowed solids and liquids into the oesophagus, i.e. swallowing.
	• Epiglottis prevents food entering respiratory tract.
	• Oesophagus:
	  ○ involuntary contraction – peristalsis to move food toward the stomach.
	• Stomach:
	  ○ acts as a food reservoir whilst it is being further broken down:
	  – pepsin (released in the stomach to break down protein)
	  – hydrochloric acid produced to kill bacteria ingested with food.
	• Pancreas:
	  ○ the function of the **pancreas** is an exocrine gland which secretes:
	  – an enzyme-rich fluid which is needed to aid **digestion** in the small intestine.
	  ○ further enzymes to assist with the additional breakdown of food:
	  – lipase, released by the pancreas to break down fat
	  – amylase released in the pancreas to break down carbohydrates into glucose
	  – trypsin, released by the pancreas to break down protein into amino acids).
	• Liver:
	  ○ bile acids produced from the liver are secreted into the small intestine and play an important role in digesting fat.
	• Gallbladder and bile ducts:
	  ○ store bile.

	• Small intestine:
	  ○ where the absorption of digested nutrients into the blood steam occurs.
	• Large intestine (colon):
	  ○ absorbs water and uses fibre to solidify any unabsorbed products to enable peristalsis to expel the resultant stool(s) via the rectum.

8.3 Describe the digestive process	• How the main nutrient groups are broken down and absorbed.
	• The transport, storage and metabolised forms of each macronutrient.
	• The inability of the body to absorb or use large particles of food, therefore using a process of digestion to break these down into smaller components which can be more easily absorbed and transported.
	• Macronutrient digestive end products:
	  ○ carbohydrates are digested and absorbed as sugars
	  ○ fats are digested and absorbed as fatty acids
	  ○ proteins are digested and absorbed as amino acids.
	• Digestive enzymes – location of release and affected nutrients:
	  ○ carbohydrate – mouth – salivary amylase
	  ○ protein – stomach – pepsin
	  ○ fat – released from the pancreas into the small intestine – lipase
	  ○ protein – released from the pancreas into the small intestine – trypsin.
	• The role of fibre in the digestive process:
	  ○ soluble fibre may reduce cholesterol in the blood and can reduce constipation
	  ○ sources of soluble fibre: fruit, vegetables, oats, golden linseeds
	  ○ insoluble fibre or non-starch polysaccharide (NSP) passes through the gut without being broken down and keeps the bowels healthy
	  ○ sources include root vegetables, nuts and seeds, oats, fruit, cereals and wholemeal bread.
	• The importance of fluid intake:
	  ○ chemical reactions in all cells take place in water
	  ○ assists the removal of waste from the body

	○ transportation and absorption of nutrients around the body ○ prevents constipation. • Timescales for the digestive process to take place: ○ initially, food will travel relatively quickly through the digestive system ○ takes about six to eight hours for food to pass through the stomach and small intestine. Food then enters the large intestine (colon) for further digestion, absorption of water and, finally, elimination of undigested food ○ in the large intestine, partially digested food can sit for more than a day while it's broken down even more, depending on food eaten: – meat and fish can take as long as two days to fully digest due to the complex protein and fat molecules – fruit and vegetables which contain fibre move through the digestive system in less than a day – processed foods can be digested in a matter of hours. ○ can take 24 to 72 hours to move through the digestive tract ○ the exact time of digestive processes will depend on the amounts and types of foods eaten and other factors such as gender, metabolism and any digestive issues that could slow down or speed up the process.

9. Understand the classification, structure and function of the energy systems	
9.1 Describe the three energy systems	• Definitions of terms: ○ aerobic – with oxygen ○ anaerobic – without oxygen. • Three energy systems: ○ creatine phosphate (CP) or phosphocreatine (PC) ○ anaerobic glycolysis/lactic acid ○ aerobic. • The energy systems resynthesise adenosine triphosphate (ATP), which is the energy currency of the body but is stored in limited amounts.

9.2 Summarise the role of the energy systems in the resynthesis of adenosine triphosphate: • anaerobic alactic (ATP-CP) • anaerobic lactic (glycolytic) • aerobic	• Anaerobic – creatine phosphate or phosphocreatine (ATP-PC or alactic system): ○ ATP and creatine phosphate (CP) are present in very small amounts in the muscle cells – so limited stores ○ can supply energy very quickly because oxygen is not needed for the process, but only lasts up to 10 seconds ○ no lactic acid is produced in the process (alactic), so no harmful waste products ○ by-product creatine (non-fatiguing) is replenished after around three to five minutes of rest ○ activities – high intensity, very short duration. • Anaerobic lactic acid (glycolytic) system: ○ uses carbohydrates (glucose) stored in the muscles as glycogen without oxygen ○ energy is produced quickly – lasts around two minutes, if trained ○ fatiguing by-product – lactic acid (muscle burn/oxygen deficit) ○ activities – moderate to high intensity, short duration. • Aerobic system (with oxygen): ○ uses carbohydrates (glucose/glycogen) and fats to replenish ATP with oxygen ○ because oxygen is required for the process, energy production takes longer but can continue for a much longer duration: slower to engage but can continue for a longer duration ○ because of the presence of oxygen, no lactic acid is produced ○ waste products – CO_2 and water (removed easily and non-fatiguing) ○ activities – low to moderate intensity, long-term duration ○ role of mitochondria (only in aerobic energy production): – cellular structure which turns the energy in food into fuel that the cell can use for energy (ATP) ○ role of each macronutrient in energy production. • Metabolism or metabolic processes (chemical processes) comprises catabolism and anabolism: ○ catabolism – breakdown of nutrients for energy production (destructive/breaks down) ○ anabolism – body uses energy released by catabolism to remake ATP (constructive – rebuilds).

	• The effects of exercise on energy systems**:**
	  ○ how each energy system works in conjunction with the others (not insolation) to produce energy in a range of activities
	  ○ how exercise variables result in the adaptation of the relative contribution of each energy system
	  ○ predominant system depends on intensity and duration:
	  – the effects of intensity (increased intensity would increase the contribution of the anaerobic systems)
	  – the effects of duration (longer-duration activities would require increased input from the aerobic energy system because the anaerobic systems cannot function effectively for long periods)
	  – excess post-exercise oxygen consumption (EPOC). The amount of oxygen the body needs to remove lactic acid and repay the oxygen debt (and return to normal after exercise)
	  – interrelationship between energy systems and efficiency of cardiovascular, respiratory and muscular systems.

10. Understand lifespan changes which affect the body system, health and wellbeing	

10.1 Outline the effects of different lifespan changes to the body systems:
• young people (13-18)
• antenatal and postnatal period
• older adults (50 plus)
	• All body systems change in response to the lifespan, particularly:
	  ○ young people in the 13-18 age range, to include:
	  – skeletal development (endomorphs, ectomorphs, mesomorphs)
	  – growth and development of the spine
	  – maturation of the skeletal system (13-18 years)
	  – growth plates and injury risk
	  – percentage (%) muscle mass changes from birth
	  – age at which bone growth completes
	  – body fat differences in adolescence
	  – obesity levels increasing and body mass index (BMI) measures.
	  ○ Ante- and post-natal, to include:
	  – skeletal system changes, including potential postural changes

	– hormone changes – effect of relaxin and other hormones, including human chorionic gonadotropin (HGC), progesterone and oestrogen – changes affecting balance – considerations for exercise, including warning signs – suitable exercise pre-16 weeks and post-16 weeks, together with considerations for postnatal. ○ Older people (50 plus), to include: – ageing and the musculoskeletal system – hormone changes, including effects of menopause – loss of bone mass and effects of exercise – changes in osteoblast/osteoclast activity – implications of reduction in bone-mineral density and connective tissue: ▪ osteopenia/osteoporosis and gender differences ▪ osteoarthritis ▪ hyaline cartilage wear and tear ▪ increased risk of falls and fractures ▪ joint degeneration ▪ reduced range of motion – sarcopenia – loss of muscle mass and effects on strength – cardiovascular disease (CVD) risk and ageing between genders (men at greater risk from younger age and women after menopause) – exercise considerations and risks. **NB**: Additional qualifications are required to work with the groups in this section.

11. Understand the effects of exercise on body systems	
11.1 Describe the effects which exercise has on the body systems	• Short-term effects: ○ muscle temperature and body temperature increases ○ increased flow of the synovial fluid into the joints ○ speeding up the frequency of nerve impulses to motor units

	○ increased breathing rate and heart rate ○ increased dilation of capillaries within the muscle ○ increased blood pressure ○ increased pliability of muscle (more flexible/stretchier) ○ delayed onset muscle soreness (DOMS) may be experienced (one to two days after training). • Long-term effects: ○ stronger heart ○ increased stroke volume ○ reduced resting heart rate ○ improved efficiency of cardiovascular system ○ improved bone mineral content and bone density ○ reduced risk of osteoporosis ○ improved release of synovial fluid into the joints ○ improved joint mobility and range of motion ○ stronger ligaments and tendons ○ improved joint stability ○ improved posture and joint alignment ○ hypertrophy ○ increased muscle strength and endurance ○ improved muscle tone and shape ○ improved synchronous recruitment of motor units ○ improved capillarisation of muscles and greater potential for delivery of oxygen and nutrients, and removal of waste products improves endurance ○ increased size and number of mitochondria ○ enhanced neuromuscular connections and improved motor skills ○ improved skill-related fitness (motor fitness): – power – speed – reaction time – agility – coordination – balance.

Anatomy and physiology for exercise and fitness professionals (H/650/4852)

Unit aim

To provide the essential knowledge of the structure and function of the body system relevant to exercise and fitness professionals.

Learners will be able to apply their knowledge of the changes to body systems through life and the effects of exercise to support clients.

Content

1. Understand anatomical terminology	
1.1 Identify terms of location	Definition of terms and anatomical examples of: • superior and inferior • anterior and posterior • medial and lateral • proximal and distal • superficial and deep.

1.2 Identify planes of movement	• Three planes which divide the body.
	• Joint actions and exercise examples in each plane:
	  ○ frontal (coronal) plane:
	  – passes from side to side at right angles to the sagittal plane
	  – divides the body into front and back sections
	  – related terminology – anterior and posterior
	  – joint actions include abduction and adduction
	  – exercise examples include side leg lifts (abduction), lateral raises, jumping jacks.
	  ○ sagittal vertical plane:
	  – passes from front to rear, dividing the body into two symmetrical halves, left and right
	  – joint actions include flexion and extension
	  – exercise examples include knee raises, leg curls, walking, running, forward lunge, biceps curl and bench press.

	○ transverse: – any horizontal plane of the body that is parallel to the diaphragm – divides the body upper and lower – joint actions include rotation, pronation and supination – exercise examples: spine rotations, oblique curls/crunches, twisting movement such as boxing jabs.

2. Understand the classification, structure and function of the skeletal system	
2.1 Summarise the classification (types) of bones	• Function and examples of each type of bone. • Bones classified by their shape and function: ○ long – femur ○ short – tarsals ○ flat – scapula ○ sesamoid – patella ○ irregular – vertebrae.
2.2 Outline the structure of bones	Different types of bone tissue: • Compact and spongy/cancellous tissue. • Long bone structure: ○ articular cartilage at the ends of bones (where joints are formed) ○ epiphysis ○ diaphysis ○ periosteum ○ epiphyseal plates (growth plates) ○ medullary cavity ○ hyaline cartilage ○ compact bone ○ cancellous bone ○ yellow and red bone marrow.

2.3 Name and locate major bones:
• axial
• appendicular
	• Axial:
	  ○ cranium
	  ○ cervical vertebrae
	  ○ thoracic vertebrae
	  ○ lumbar vertebrae
	  ○ sacral vertebrae
	  ○ coccyx
	  ○ sternum, ribs.
	• Appendicular:
	  ○ scapula
	  ○ clavicle
	  ○ humerus
	  ○ ulna
	  ○ radius
	  ○ carpals
	  ○ metacarpals
	  ○ phalanges
	  ○ ilium, ischium
	  ○ pubis
	  ○ femur
	  ○ patella
	  ○ tibia
	  ○ fibula
	  ○ tarsals
	  ○ metatarsals.

2.4 Outline the structure and function of the spine	Structure of the vertebral column: • Regions – cervical, thoracic, lumbar, sacral and coccygeal. • The number of vertebrae in each spinal section. • Four natural curves (two kyphotic, two lordotic). • Function of curves. • The roles that lordotic and kyphotic curves play in posture and achieving a ‘neutral spine’. • Potential ranges of movement in different spinal regions, including joint actions.

2.5 Outline abnormal degrees of curvature of the spine and their implications for exercise	• Curvatures that deviate from optimal posture/alignment and their implications on movement:
	  ○ scoliosis
	  ○ hyper lordosis
	  ○ hyper kyphosis
	  ○ flat back
	  ○ sway back.
	• Factors that may contribute to suboptimal spinal curvatures:
	  ○ muscle imbalances
	  ○ genetic conditions
	  ○ lifestyle factors
	  ○ medical conditions
	  ○ pregnancy.

2.6 Describe the functions of the skeleton	Functions and examples: • muscle attachments and levers – muscles attach to bones (levers) and exert a force to pull on the bones to create movement at joints (fulcrum): ○ with consideration of different types of leverage systems in the body and examples, first class – head and neck, second class – ankle and third class – knee, etc. • protection of internal organs, e.g. brain is protected by cranium, heart and lungs are protected by the rib cage • production of red and white blood cells in the bone marrow • skeletal framework provides body shape and a foundation structure • storage of calcium and other minerals.

2.7 Summarise the stages of bone development, growth and repair	• process of bone growth – ossification
	• stages of bone growth – from foetal, birth, through to adolescence and older age
	• remodelling process:
	  ○ the roles of osteoblasts, osteoclasts and osteocytes
	  ○ the roles of calcium, vitamin D and hormones
	• ageing/lifespan process – when bones stop growing in length, when bones lose calcium, including the effects of menstrual cycle and menopause, osteopenia/osteoporosis
	• factors that affect growth:
	  ○ exercise – weight bearing
	  ○ age

	○ lifestyle factors – smoking, nutrition, alcohol, etc. ○ sunlight ○ hereditary factors.
2.8 Summarise the classification of joints	Examples of different classifications and differences in function and movement potential: • fibrous – immoveable • cartilaginous – slightly moveable • synovial – freely moveable.
2.9 Outline the structure of freely movable joints: • types • ligaments	• Structure of a synovial joint – joint capsule, synovial membrane, synovial fluid, ligaments, tendons and cartilage (hyaline and fibrocartilage). • Types – hinge, saddle, gliding, pivot, condyloid, ball and socket. • Structural differences of different types of joint and how this affects movement potential. • Function of ligaments: non-elastic, prevent/limit unwanted movement, attach bone to bone, joint stability. • Function of tendons. • Function of cartilage.
2.10 Describe the function of joints: • joint actions at specific joints • related planes of movement • mobility • stability	• The movement potential at different types of synovial joint (see types within 2.9). • Joint actions available at specific joints: ○ flexion and extension, e.g. knee ○ adduction and abduction, e.g. hip ○ rotation, e.g. between axis and atlas ○ circumduction, e.g. shoulder ○ horizontal flexion and horizontal extension, e.g. shoulder ○ elevation and depression, e.g. shoulder girdle ○ lateral flexion and lateral extension, e.g. spine ○ pronation and supination, e.g. forearm – radioulnar joint ○ plantar flexion and dorsi flexion, e.g. ankle ○ protraction and retraction, e.g. shoulder girdle ○ inversion and eversion. • Movement planes in which different joint actions happen: ○ frontal (coronal), sagittal and transverse planes. • Factors affecting joint mobility and stability: ○ structure – see different joint types (2.9)

	○ location, e.g. hip and shoulder different functions ○ flexibility of surrounding tissues (laxity of ligaments) ○ injury (damage to articular surfaces).

3. Understand the classification, structure and function of the muscular system	
3.1 Summarise the types and properties of muscle tissue	Different types of tissue, properties and examples: • Skeletal – striated: ○ voluntary – conscious control, controlled by somatic nervous system. Found in consciously controlled skeletal muscles. • Smooth: ○ involuntary – unconscious control, controlled by autonomic nervous system. Found in structures not under conscious control, e.g. blood vessels, digestive system. • Cardiac – heart: ○ involuntary – striated, unconscious control, initiated by the sinoatrial node (SA node).
3.2 Summarise the structure of skeletal muscles	• Structure: ○ muscle comprises (or consists of, made up from) water (70%), protein (23%), minerals and substrates (7%): – fascia – connective tissue – muscle fibres – fasciculi – epimysium – endomysium – perimysium – myofibrils – myofilaments – sarcomeres – actin and myosin – mitochondria (cells) and their role. ○ muscle attachments (and examples): – aponeurosis – direct to bone

	– muscles cross joints, attach to bones via tendons – origins and insertions.
3.3 Describe skeletal muscle fibre types and their characteristics	• Different types of muscle fibres and characteristics: ○ slow twitch type I – slow oxidative ○ fast twitch type 2a (intermediate) – fast oxidative glycolytic ○ fast twitch type 2b – fast glycolytic. • Relationships with: ○ energy systems – aerobic and anaerobic: – different types of training. . ○ Factors that influence fibre type: – genetics – ageing – types of exercise.
3.4 Name and locate the major skeletal muscles: • upper, lower, anterior, posterior • global and local postural stabilisers	• Location: ○ local/global ○ superficial/deep. • Location of: ○ rotator cuff: – SITS (S: supraspinatus I: infraspinatus T: teres minor S: subscapularis) ○ shoulder girdle: – levator scapulae, pectoralis major, pectoralis minor, serratus anterior, trapezius, rhomboids major/minor, teres major ○ arms and shoulders: – biceps, triceps, deltoids ○ back: – latissimus dorsi – spinal extensors: erector spinae, iliocostalis, longissimus, spinalis, multifidus, quadratus lumborum ○ pelvic girdle and hip: – flexors (iliopsoas): iliacus, psoas major – extensors: gluteals, gluteus maximus and hamstrings group

	– adductors: magnus, brevis, longus, pectineus, gracilis, sartorius – abductors: gluteus medius, gluteus minimus, piriformis, tensor fascia latae ○ legs: – quadriceps: rectus femoris, vastus medialis, vastus intermedius, vastus lateralis – hamstrings: biceps femoris, semimembranosus, semitendinosus – tibialis anterior, gastrocnemius, soleus. ○ abdominals: – internal and external obliques, transversus abdominus, rectus abdominis. ○ respiratory muscles: – intercostals and diaphragm – accessory muscles – forced inspiration (sternocleidomastoid, pectoralis minor and major, serratus anterior, scalenes and latissimus dorsi) and forced expiration (all abdominal group) ○ 'core' and pelvic floor muscles.
3.5 Outline the joint actions produced by major skeletal muscles: • upper, lower, anterior, posterior • global and local postural stabilisers	• Related function and joint action produced by concentric and eccentric contraction of specific muscles. • See 2.10 and 3.4.
3.6 Describe the roles of skeletal muscles	• Roles – agonists (prime movers), antagonists, synergists, fixators: ○ examples in relation to exercises and movements. • Functions and properties of muscles: ○ contract to create movement or assist in the stabilisation of joints ○ generate heat (shivering) ○ keep the body upright by resisting the force of gravity: – posture

	○ protect the skeletal system by preventing excessive or unwanted movement ○ properties – contractility, extensibility, elasticity and excitability.
3.7 Describe the process/principles of muscular contraction	Interrelationship with nervous system: • All or none law. • Sliding filament theory, the role of actin and myosin, the formation of a cross-bridge during contraction, the role of ATP, motor neuron impulses, motor unit recruitment. • Stretch (myotatic) reflex and inverse stretch reflex. • Size principle of motor unit recruitment. • Other principles of muscle work (biomechanics and kinesiology): ○ muscles only pull (apply force) on bones (levers), they cannot push, contract in direction of fibres ○ cross joints (fulcrum) and create movement ○ work in pairs/groups ○ muscles roles (see previous points).
3.8 Outline the types of muscular contraction	• Types of contraction: ○ concentric and eccentric (isotonic) ○ isometric ○ isokinetic ○ the effects of gravity on muscle work and the effects of fixed resistance/pulley equipment on muscle work. • Advantages and disadvantages of isotonic/isometric movement in relation to everyday activity, activity for health and within an exercise and fitness session, to include: ○ causes and effects of delayed onset muscle soreness (DOMS) ○ Valsalva effect: functionality and effects on blood pressure.
3.9 Outline the structure and function of the pelvic floor muscles	• Structure: ○ deep and superficial layers ○ fast- and slow-twitch muscle fibres ○ muscle attachments. • Function: ○ stability for the pelvic girdle ○ support for organs and growing foetus during pregnancy

	○ controlling continence ○ as lower part of inner cylinder – stability (along with diaphragm, abdominals, back muscles) ○ counteract changes in abdominal pressure.

4. Understand the classification, structure and function of the cardiovascular system	
4.1 Summarise the structures of the cardiovascular system	• Heart – myocardium (cardio): ○ muscular pump ○ two halves – right (deoxygenated blood) and left (oxygenated blood) ○ four chambers – right and left ventricles, right and left atria ○ valves (prevent back flow) – bicuspid, tricuspid, aortic, pulmonary. • Blood vessels (vascular): ○ comprise: arteries, arterioles (smaller versions of arteries) veins, venules (smaller versions of veins) and capillaries (smallest of the blood vessels): – capillaries: ▪ are the smallest blood vessels – one blood cell thick – veins: ▪ carry blood towards the heart at low pressure ▪ deoxygenated blood in all except the pulmonary veins ▪ have thinner, less muscular walls ▪ have a series of one-way (non-return) valves to prevent backflow of blood and require the assistance of skeletal muscle to help venous return ▪ the vena cava has two branches (inferior and superior) and returns blood from the body back to the right atrium ▪ the pulmonary veins return blood back to the left atrium. – arteries: ▪ carry blood away from the heart at high pressure ▪ oxygenated blood in all arteries except the pulmonary arteries

	▪ are pressurised and have thick, smooth, muscular walls ▪ the aorta is the largest/major artery that carries blood from the left ventricle to the body ▪ the pulmonary arteries carry blood from the right ventricle to the lungs.
4.2 Describe the function of the cardiovascular system	• Location/size of the heart: ○ behind the sternum, just to the left of centre ○ size of a clenched fist. • Functions: ○ circulation of blood (deoxygenated/oxygenated) and nutrients, hormones, medications. • Terminology – definitions of: ○ stroke volume – amount of blood pumped in one beat ○ cardiac output – amount of blood pumped in one minute ○ heart rate – beats per minute, pulse monitoring points, e.g. radial artery. • Effects of exercise on the above.
4.3 Outline the flow of blood around the systemic and pulmonary systems	• Systemic circulation – flow around heart and body: ○ from heart to body – aorta, arteries, arterioles, capillaries: – gaseous exchange at muscular levels (mitochondria) ○ from body to heart – venules, veins, superior/inferior vena cava, right atrium (systemic). • Pulmonary circulation – flow around heart and lungs: ○ from lungs to heart – pulmonary vein, left atrium, left ventricle (pulmonary) ○ from heart to lungs – right ventricle, pulmonary artery: – gaseous exchange in the lungs. • Interrelationship with respiratory system and muscular system – gaseous exchange.
4.4 Outline blood pressure: • classifications • systolic/diastolic	The body's need for blood pressure. • Definitions: ○ blood pressure as a measure of force in the artery walls. ○ systolic blood pressure: – the pressure in the arteries (contracting/pumping phase)

	○ diastolic blood pressure: – the pressure in the arteries (resting/filling phase). • Classifications: ○ systolic and diastolic readings: – optimal, normal blood pressure classifications – hypotension, pre-hypertension and hypertension (different stages) ○ current and up-to-date guidelines regarding blood pressure detailed from the following bodies: – World Health Organization (WHO) – National Institute for Health and Care Excellence (NICE) – American College of Sports Medicine (ACSM) ○ effects of exercise on blood pressure: – linear increase – issues when working with hypertensive clients – when exercise is contraindicated.

5. Understand the classification, structure and function of the respiratory system	
5.1 Summarise the structure of the respiratory system	Respiratory tract – upper and lower: • Upper: ○ nose and mouth ○ pharynx ○ larynx. • Lower: ○ trachea (windpipe) ○ lungs: – bronchus (bronchi) – bronchioles: ▪ alveolus (alveoli and capillaries) and location of gaseous exchange ▪ how the alveoli and capillaries link the respiratory and cardiovascular systems.

5.2 Outline the function of the respiratory system	• The position of the lungs within the thoracic cavity.
	• Function:
	  ○ intake of oxygen
	  ○ removal of carbon dioxide
	  ○ gaseous exchange
	  ○ diffusion: the movement of molecules from an area of greater concentration to an area of lesser concentration.
	• The passage of air through the respiratory tract during inhalation (inspiration) and exhalation (expiration):
	  ○ nose and mouth
	  ○ pharynx
	  ○ larynx
	  ○ trachea
	  ○ bronchi
	  ○ bronchioles
	  ○ alveoli.
	• Terminology:
	  ○ breathing (pulmonary ventilation: inhalation/exhalation) – the process of physically moving air in and out of the lungs
	  ○ respiration is the name given to the overall exchange of gases between the atmosphere and the blood and involves:
	  – external respiration – the exchange of gases between the lungs and the blood
	  – internal respiration – the exchange of gases between the blood and the cells of the body
	  ○ the process of respiration:
	  – take in air from the atmosphere – inhalation/inspiration
	  – gaseous exchange alveoli
	  – pass oxygen into the circulatory system
	  – remove carbon dioxide from the circulatory system via exhalation
	  ○ composition of air during:
	  – inhalation
	  – exhalation
	  ○ average respiratory rate – 12-20 breaths per minute:

	– factors affecting respiratory rate and efficiency: ▪ exercise ▪ respiratory diseases – chronic obstructive pulmonary disease (COPD) asthma, long covid, etc.
5.3 Outline the mechanism and control of breathing	• Respiration is controlled by the respiratory centre located in the medulla oblongata of the brain. • Breathing is triggered by: o stimulation of the stretch receptors in the intercostal muscles o rising carbon dioxide levels o decreasing oxygen levels o stimulation from phrenic nerves o chemoreceptors o decreased pH of the blood. • The function and location of each muscle involved in inhalation and exhalation. • Natural breathing: o intercostals (internal and external): – inspiration externals contract and lift the ribs up – expiration externals relax and the ribs lower o diaphragm: – inspiration contracts and descends – expiration relaxes and ascends. • Forced inspiration (inhalation): o accessory muscles – scalenes, pectoralis minor and sternocleidomastoid. • Forced expiration (exhalation): o accessory muscles – abdominals – transversus. • Differences/interrelationship: o ventilation – getting air in and out o respiration – exchange of gases and transport of gases: – ventilation – air into lungs – pulmonary diffusion – gaseous exchange in the lungs – circulation of gases around the body

	– tissue diffusion – use of oxygen for energy production and removal of CO_2 ○ lung volume terminology/definitions: – residual volume – amount of air left in the lungs after exhalation – tidal volume – amount of air moved in and out of the lungs in one breath – vital capacity – maximum amount of air that can be forcefully inhaled and exhaled in one breath.
5.4 Outline the process of gaseous exchange	• Gaseous exchange of oxygen and carbon dioxide in the body. • The role of the alveoli and capillaries in gaseous exchange: ○ oxygen (alveoli) moves from the lungs to the bloodstream (capillaries) ○ carbon dioxide passes from the blood (capillaries) to the lungs (alveoli) to be exhaled. • The process of the diffusion of gases from areas of high concentration to areas of low concentration.

6. Understand the classification, structure and function of the nervous system	
6.1 Summarise the structure and divisions of the nervous system	Main divisions: • Central nervous system (CNS): ○ the brain and spinal cord. • Peripheral nervous system (PNS): ○ motor and sensory nerves that branch out from the spinal cord. • PNS is divided into: ○ somatic nervous system ○ autonomic nervous system (ANS) ○ two sub-divisions of autonomic nervous system (ANS): – sympathetic (speeds up processes) – parasympathetic (slows down processes).
6.2 Describe the functions of the nervous system	• Communication and control system of the body. • Works collaboratively with the endocrine system. • Maintaining homeostasis. • Three key roles:

	1. Sensory – detects changes in the body's internal environment and gathers information about the external environment. Information is received from different stimuli. – role of internal receptors: ▪ chemoreceptors (chemical) ▪ thermoreceptors (temperature) ▪ baroreceptors (blood pressure) ▪ proprioceptors (body positioning). 2. Interpretation – analyses and interprets the changes sensed and selects the appropriate response. 3. Motor output – responds to the changes by signalling the required action, e.g. the secretion of hormones from the endocrine glands, or by initiating muscle contraction.
6.3 Outline the role of each subdivision of the peripheral nervous system: • somatic • autonomic	• Somatic nervous system: o motor and sensory nerves that connect the PNS to muscles and are involved in conscious activities (voluntary muscle actions). • Autonomic nervous system: o motor and sensory nerves that connect the PNS to smooth and cardiac muscle and are involved in involuntary actions such as digestion, control of blood pressure, etc. o two divisions autonomic nervous system (ANS): – sympathetic (fight or flight, war) – speed up. – parasympathetic (rest and digest, peace) – slow down. • Afferent and efferent nerves: o afferent nerves (sensory neurons) carry messages from the body receptors to the CNS. They are the first cells to receive incoming information o efferent nerves (motor neurons) carry messages from the CNS to the muscles and glands o interneurons (relay neurons) enable communication between sensory or motor nerves and the CNS.
6.4 Outline the structure of nerves	• Structure and function of: o axons o dendrites o cell body o nucleus

	○ myelin sheath ○ Schwann cells ○ nodes of Ranvier ○ synapses.
6.5 Outline the process of a nerve impulse	• Interrelationship with the muscular system: ○ action potentials: – how nerve impulses are conducted ○ basic sliding filament theory ○ role of actin and myosin in the formation of a cross-bridge during contraction ○ the role of ATP ○ the 'all or none' law ○ motor neuron impulses, motor unit recruitment.
6.6 Outline the function of: • motor units • proprioceptors • muscle spindles • Golgi tendon organs	• Motor unit comprises one motor nerve and all the muscle fibres it causes to contract: ○ the number of these muscle fibres can vary from one or two to 1000: – a stimulus must be strong enough to trigger an action potential to pass down the motor neuron – all muscle fibres within a single motor unit will be maximally innervated by the action potential or none will – the size principle of motor unit recruitment: motor units are recruited in order of size, from small to large. • Proprioceptor is a sensory organ which receives stimuli from within the body to give detailed and continuous information about the position of the limbs and other body parts. • Muscle spindle is a proprioceptor located within the body of a skeletal muscle that primarily detect changes in the length of the muscle. • Golgi tendon organ (GTO) is a proprioceptor located within a tendon that detects how much tension is being transferred into the muscle. • Interrelationship of proprioceptors with exercise: ○ stretching (lengthening) – PNF and developmental stretching ○ muscle contraction – the more motor units which are activated, the greater the strength of contraction.

7. Understand the classification, structure and function of the endocrine system

7.1. Summarise the structure of the endocrine system:

- major glands
- hormones

7.2 Describe the functions of the endocrine system:

- hormones
- major glands and the hormones they secrete

- Structure:
  - comprised of several glands that produce and secrete hormones
  - hypothalamus (the 'master gland') because it controls the pituitary gland:
    - controls most of the other endocrine glands in the body
    - connects the nervous and endocrine system
  - location of different glands (see table)
  - function of other glands and hormones (see table)
  - different types of hormone, e.g. steroid, peptide, anabolic, catabolic
  - how endocrine and nervous system communicate, e.g. feedback loops.

Gland	Hormone (to include)	Action/role (to include)
Thyroid	Thyroxine	To regulate metabolism of all cells and tissues in the body.
Parathyroid	Parathyroid hormone (PTH)	To control calcium levels within the blood.
Pituitary	Human growth hormone (HGH)	To regulate body composition, body fluids, muscle and bone growth.
Pineal	Melatonin	To help maintain normal sleep patterns.

Gland	Hormone (to include)	Action/role (to include)
Adrenal	Epinephrine (adrenaline) Norepinephrine (noradrenaline)	Initiates sympathetic responses to stress (fight or flight).
	Cortisol	Regulates conversion of fats, proteins and carbohydrates to energy.
Pancreas	Insulin	Helps cells to take in glucose to be used for energy, i.e. lowers blood sugar levels.
	Glucagon	Signals cells to release glucose into the blood, i.e. raises blood sugar levels.
Ovaries	Oestrogen	Female 'characteristics'. Breast development.
	Progesterone	Menstrual cycle/egg production. Promotes fat storage.
Testes	Testosterone	Male 'characteristics' include increased muscle, bone mass and the growth of body hair.

8. Understand the structure and function of the digestive system	
8.1 Describe the function of the digestive system	• Breakdown of food into nutrients such as carbohydrates, fats and proteins so that they can then be absorbed into the bloodstream for energy, growth and repair: ○ ingestion ○ digestion ○ absorption ○ excretion.
8.2 Summarise the function of each of the main structures within the digestive system	Alimentary canal/gastrointestinal (GI) tract (digestive system structures and accessory organs): • Mouth (tongue – accessory organ, teeth, salivary glands): ○ mastication (mechanical breakdown of food, i.e. chewing) ○ moistening (softening of food with saliva) ○ emulsification enzymes within saliva (salivary amylase) begin to break down food starches into sugar, i.e. complex carbohydrates into simple carbohydrates. • Pharynx (throat): ○ permits the passage of swallowed solids and liquids into the oesophagus, i.e. swallowing. • Epiglottis prevents food entering respiratory tract. • Oesophagus: ○ muscular tube that connects the pharynx (throat) to the stomach. Involuntary contraction with a peristaltic (wave like) action to move food toward the stomach. • Stomach: ○ acts as a food reservoir whilst food is being further broken down: – mechanically by peristalsis – chemically by enzymes such as pepsin (released in the stomach to break down protein) and those produced by the pancreas (see below) and hydrochloric acid produced to kill bacteria ingested with food. • Pancreas: (accessory organ): ○ the function of the **pancreas** as an exocrine gland ○ secretes an enzyme-rich fluid needed to aid **digestion** in the small intestine. ○ secretes further enzymes to assist with the additional breakdown of food:

	– lipase, released by the pancreas to break down fat – amylase, released in the pancreas to break down carbohydrates into glucose – trypsin, released by the pancreas to break down protein into amino acids. • Liver (accessory organ): o produces and secretes bile, which aids in the emulsification of fats o bile acids are secreted into the small intestine and play an important role in digesting fat. • Gallbladder and bile ducts (accessory organ): o store bile. • Small intestine: o where the absorption of digested nutrients into the blood steam occurs: – villi and microvilli – the inner surface folds and finger-like projections that provide a large surface area in the small intestine to allow for effective absorption. • Large intestine (colon): o absorbs water and uses fibre to solidify any unabsorbed products to enable peristalsis to expel the resultant stool(s) via the rectum.
8.3 Describe the digestive process	• How the main nutrient groups are broken down and absorbed. • The transport, storage and metabolised forms of each macronutrient. • The inability of the body to absorb or use large particles of food, therefore using a process of digestion to break these down into smaller components which can be more easily absorbed and transported. • Macronutrient digestive end products: o carbohydrates are digested and absorbed as sugars o fats are digested and absorbed as fatty acids o proteins are digested and absorbed as amino acids. • Digestive enzymes – location of release and affected nutrients: o carbohydrate – mouth – salivary amylase o protein – stomach – pepsin

	○ fat – released from the pancreas into the small intestine – lipase ○ protein – released from the pancreas into the small intestine – trypsin. • The role of fibre in the digestive process: ○ soluble fibre may reduce cholesterol in the blood and can reduce constipation ○ sources of soluble fibre (fruit, vegetables, oats, golden linseeds) ○ insoluble fibre or non-starch polysaccharide (NSP) passes through the gut without being broken down and keeps the bowels healthy ○ sources include root vegetables, nuts and seeds, oats, fruit, cereals and wholemeal bread. **The importance of fluid intake:** • Chemical reactions in all cells take place in water. • Assists the removal of waste from the body. • Transportation and absorption of nutrients around the body. • Prevents constipation. • Timescales for the digestive process to take place. • Initially, food will travel relatively quickly through the digestive system. • Takes about six to eight hours for food to pass through the stomach and small intestine. Food then enters the large intestine (colon) for further digestion, absorption of water and, finally, elimination of undigested food. • In the large intestine, partially digested food can sit for more than a day while it is broken down even more (depends on type of food, e.g. processed foods digested quicker): ○ meat and fish can take as long as two days to fully digest due to the complex protein and fat molecules. ○ fruit and vegetables which contain fibre move through the digestive system in less than a day. ○ processed foods can be digested in a matter of hours. • Can take 24 to 72 hours to move through the digestive tract. • The exact time of digestive processes will depend on the amounts and types of foods eaten and other factors such as gender, metabolism and any digestive issues that could slow down or speed up the process.

9. Understand the classification, structure and function of the energy systems	

9.1 Describe the three energy systems	• Definitions of terms:
	  ○ aerobic – with oxygen
	  ○ anaerobic – without oxygen.
	• Three energy systems:
	  ○ creatine phosphate (CP) or phosphocreatine (PC)
	  ○ anaerobic glycolysis/lactic acid
	  ○ aerobic.
	• The energy systems resynthesise adenosine triphosphate (ATP), which is the energy currency of the body, but is stored in limited amounts.

9.2 Summarise the role of the energy systems in the resynthesis of adenosine triphosphate	• Anaerobic – creatine phosphate or phosphocreatine (ATP-PC or alactic system):
	  ○ ATP and creatine phosphate (CP) are present in very small amounts in the muscle cells – so limited stores
	  ○ can supply energy very quickly because oxygen is not needed for the process – but only lasts up to 10 seconds
	  ○ no lactic acid is produced in the process (alactic), so no harmful waste products
	  ○ by-product creatine (non-fatiguing) is replenished (around three to five minutes rest)
	  ○ Activities – high intensity, very short duration.
	• Anaerobic lactic acid (glycolytic) system:
	  ○ uses carbohydrates (glucose) stored in the muscles as glycogen without oxygen
	  ○ energy is produced quickly – lasts around two minutes, if trained
	  ○ fatiguing by-product – lactic acid (muscle burn/oxygen deficit)
	  ○ activities – moderate to high intensity, short duration.
	• Aerobic system (with oxygen):
	  ○ uses carbohydrates (glucose/glycogen) and fats to replenish ATP with oxygen
	  ○ because oxygen is required for the process, energy production takes longer, but can continue for a much longer duration: slower to engage, but can continue for a longer duration
	  ○ because of the presence of oxygen, no lactic acid is produced

	○ waste products – CO_2, and water (removed easily and non-fatiguing) ○ activities – low to moderate intensity, long-term duration ○ role of mitochondria (only in aerobic energy production): – cellular structure, which turns the energy in food into fuel that the cell can use for energy (ATP) ○ role of each macronutrient in energy production. • Metabolism or metabolic processes (chemical processes) comprises catabolism and anabolism: ○ catabolism – breakdown of nutrients for energy production (destructive/breaks down) ○ anabolism – body uses energy released by catabolism to remake ATP (constructive – rebuilds). The effects of exercise on energy systems**:** • How each energy system works in conjunction with the others (not insolation) to produce energy in a range of activities. • How exercise variables result in the adaptation of the relative contribution of each energy system. • Predominant system depends on intensity and duration: ○ the effects of intensity (increased intensity would increase the contribution of the anaerobic systems) ○ the effects of duration (longer-duration activities would require increased input from the aerobic energy system because the anaerobic systems cannot function effectively for long periods) ○ excess post-exercise oxygen consumption (EPOC) – the amount of oxygen the body needs to remove lactic acid and repay the oxygen debt (and return to normal after exercise) ○ interrelationship between energy systems and efficiency of cardiovascular, respiratory and muscular systems.

10. Understand the interrelationship between the anatomical and physiological systems	
10.1 Explain the Interrelationship of the body system: • movement systems – musculoskeletal system • fuelling systems – circulatory, respiratory, energy • response systems – nervous, endocrine	• All body systems work together: ○ if one system is malfunctioning due to disease, then all systems will be impacted to a greater or lesser extent ○ activity and exercise will affect all systems, in some way ○ the body systems change through the lifespan ○ some examples of interrelationship: – respiratory system takes in oxygen that is circulated by the cardiovascular and circulatory system – oxygen transported by the cardiovascular system is used by the muscles (and other body cells) to produce energy – all body cells and systems require energy (ATP and energy systems) for daily living as well as movement – hormones and nutrients (endocrine and digestive system) are circulated by the cardiovascular system – the nervous system controls movement of the body, stimulating muscles (muscular system) to contract and pull on the bones (skeletal system) – the endocrine system and nervous system are main communication and control systems of the body (chemical and electrical) – endocrine glands release hormones, which are circulated by the cardiovascular and circulatory systems – The heart, a component of the circulatory system responsible for pumping blood, is also a muscle (cardiac) and is controlled by the nervous system.

11. Understand lifespan changes which affect the body system, health and wellbeing	
11.1 Outline the effects of different lifespan changes to the body systems: • young people (13-18) • antenatal and postnatal period • older adults (50 plus)	• All body systems change in response to the lifespan, particularly: o young people in the 13-18 age range, to include: – skeletal development (endomorphs, ectomorphs, mesomorphs) – growth and development of the spine – maturation of the skeletal system (13–18 years) – growth plates and injury risk – percentage (%) muscle mass changes from birth – age at which bone growth completes – body fat differences in adolescence – obesity levels increasing and body mass index (BMI) measures o antenatal and postnatal, to include: – skeletal system changes, including potential postural changes – hormone changes – effect of relaxin and other hormones, including human chorionic gonadotropin (HGC), progesterone and oestrogen – changes affecting balance – considerations for exercise, including warning signs – suitable exercise pre-16 weeks and post-16 weeks, together with considerations for postnatal o older people (50 plus), to include: – ageing and the musculoskeletal system – hormone changes, including effects of menopause – loss of bone mass and effects of exercise – changes in osteoblast/osteoclast activity – implications of reduction in bone-mineral density and connective tissue: ▪ osteopenia/osteoporosis and gender differences ▪ osteoarthritis ▪ hyaline cartilage wear and tear

	▪ increased risk of falls and fractures ▪ joint degeneration ▪ reduced range of motion – sarcopenia – loss of muscle mass and effects on strength – cardiovascular disease (CVD) risk and ageing between genders (men at greater risk from younger age and women after menopause) – exercise considerations and risks. **NB: Additional qualifications are required to work with the groups in this section.**

12. Understand the effects of exercise on the body systems	

12.1 Describe the short-term effects which exercise has on the musculoskeletal system	• Muscle temperature and overall core body temperature increase.
	• Levels of lactic acid in the blood rise, causing a burning or aching sensation in the muscles:
	  ○ results in temporary muscle fatigue.
	• Greater ease of joint movement due to:
	  ○ increased flow and viscosity of the synovial fluid into the joints
	  ○ nourished cartilage as a result of the increased synovial fluid into the joints.
	• Increased metabolic activity.
	• Increased demand for oxygen.
	• Increased dilation of capillaries within the muscle.
	• Increased pliability of muscle and connective tissue (more flexible/stretchier).
	• Delayed onset muscle soreness (DOMS) may be experienced (one to two days after training).

12.2 Describe the short-term effects which exercise has on the circulatory and respiratory systems of the body	• Increased breathing rate and depth of breathing to bring more oxygen into the body and remove carbon dioxide. • Increased tidal volume. • Increased efficiency of gaseous exchange. • Vasodilation of blood vessels to the muscles. • Vasoconstriction of blood vessels to the internal organs. • Anticipatory heart rate. Before starting exercise, the heart rate will increase slightly in anticipation of the forthcoming activity.

	This is in response to nervous and chemical signals that supply the heart. • Increase of heart rate to circulate blood and oxygen. • Increase of stroke volume (a greater amount of blood will be pumped on each beat of the heart). • Increased cardiac output (a greater amount of blood will be pumped by the heart in one minute). • Increase in systolic blood pressure. • Vasodilation of the capillaries – the capillaries widen to enable increased blood to pass through. • Increased blood flow to muscles. • Redirection of blood flow. During exercise, blood flow will be prioritised to the areas in greater need of supply, e.g. the muscles. The supply of blood to other body areas, such as the kidneys, will reduce to enable this redirection.

12.3 Describe the short-term effects which exercise has on the response systems of the body	• Nervous system:
	  ○ neuromuscular pathways engaged
	  ○ increased nerve to muscle connection.
	• Energy systems:
	  ○ ATP broken down to produce energy
	  ○ ATP resynthesised through different energy systems, depending on intensity and duration of activity and individual fitness (physiological adaptations)
	  ○ lactic acid build up during high intensity activities – 'the burn'
	  ○ increase in lactate production.
	• Endocrine system:
	  ○ increased number of hormones circulating
	  ○ strengthens receptor sites at target organ cells
	  ○ exercise programmes that include intense bursts of energy may stimulate the release of thyroxine from the thyroid gland
	  ○ improved circulation of blood (epinephrine and thyroxine)
	  ○ release of hormones like endorphins and adrenaline.

12.4 Describe the long-term effects which exercise has on the musculoskeletal system	• Skeletal:
	  ○ improved bone mineral content (increase in bone density)
	  ○ improved development of peak bone mass in formative years (up to age 30)
	  ○ maintenance of bone mass pre-menopause

	○ reduces rate of bone loss – post menopause ○ reduced risk of osteoporosis. ○ improved release of synovial fluid into the joints ○ cartilage is nourished by synovial fluid, which can assist with the management of osteoarthritis, and maintains joint health ○ improved joint mobility and range of motion: d joints able to move through their full potential range of motion ○ hyaline cartilage becomes thicker, protecting the joints against wear and tear ○ stronger ligamentous attachments ○ improved stability of the joints (due to stronger muscular support) ○ reduced risk of joint injury ○ reduced risk of falls and bone fractures in older adults with osteoporosis ○ improved posture and joint alignment ○ reduced risk of low back pain. • Muscular: ○ hypertrophy of muscle fibres (increase in size due to increased number of myosin and actin within muscle) ○ increased muscle strength and endurance ○ improved muscle tone and shape ○ improved capillarisation of muscles and greater potential for delivery of oxygen and nutrients and removal of waste products improves endurance ○ increased size and number of mitochondria in muscles to enable greater aerobic energy production ○ improved posture ○ stronger tendinous attachments. • Risks: ○ increased risk of injury ○ increased loading placed on synergists ○ shortening/weakening ○ poor technique may lead to altered roles, e.g. synergists/fixators becoming prime movers ○ overuse ○ delayed onset muscular soreness (DOMS).

12.5 Describe the long-term effects which exercise has on the circulatory and respiratory systems of the body	• Increased strength of intercostal muscles and diaphragm, which enables the chest cavity to expand:
	  ○ increased tidal volume
	  ○ increased vital capacity.
	• Decreased breathing rate.
	• Improved potential for gaseous exchange.
	• Stronger heart (cardiac muscle).
	  The left ventricle thickens (hypertrophy) to enable more forceful contractions:
	  ○ increased resting and maximal stroke volume
	  ○ increased maximal cardiac output.
	• Greater heart efficiency:
	  ○ improved recovery heart rate
	  ○ decreased resting heart rate (heart rate at rest)
	  ○ lower working heart rate at same intensity or effort.
	• Increased number of capillaries in muscles:
	  ○ improved blood flow to working muscles
	  ○ increased potential for oxygen delivery to muscles
	  ○ increased potential for removal of waste products (lactate) from the muscles
	  ○ lowering of blood pressure.
	• Increased size and number of mitochondria (cells used for aerobic energy production).

12.6 Describe the long-term effects which exercise has on the response systems of the body	• Nervous system:
	  ○ strengthening of existing nerve connections and development of new ones
	  ○ improved synchronisation of motor recruitment, which helps achieve stronger muscular contractions
	  ○ improved balance due to improved efficiency of proprioceptors
	  ○ improved reaction times due to increased frequency and strength of nervous impulses
	  ○ improved agility due to improved speed and frequency of signal and neural connections
	  ○ improved neuromuscular pathways and connections
	  ○ more effective transmission of nerve impulses
	  ○ improved proprioception – spatial and body awareness
	  ○ improved skill-related fitness (motor fitness):

	– power – speed – reaction time – agility – coordination – balance ○ improved motor unit recruitment. • Energy systems – links with 12.5: ○ aerobic adaptations ○ stronger heart (cardiac muscle) to enable more forceful contractions ○ increased resting and maximal stroke volume ○ increased maximal cardiac output ○ improved blood flow to working muscles ○ decreased resting heart rate (heart rate at rest) ○ lower working heart rate at same intensity or effort ○ increased size and number of mitochondria (cell organelles used for aerobic energy production) ○ increased number of capillaries in muscles ○ increased potential for oxygen delivery to muscles ○ increased potential for removal of waste products from the muscles. • Anaerobic adaptations: ○ increased storage capacity of creatine phosphate and muscle glycogen ○ improved resistance to fatigue during anaerobic conditions (lactate tolerance) ○ improved efficiency at removing lactic acid and by-products ○ improved recovery rate after high-intensity exercise. • Endocrine system: ○ increases in testosterone and human growth hormone post resistance training ○ improved insulin sensitivity ○ increases in insulin growth factor-1 ○ greater glucagon production ○ impaired adrenal and growth hormone responses during overtraining

	○ may improve organ function ○ increased metabolic rate, which may assist weight management ○ reduced risk of diabetes ○ improved mental state (endorphins) ○ improved confidence and motivation (testosterone) ○ reduced tension and anxiety (endorphins) ○ euphoria (endorphins) ○ reduced sensitivity to pain (endorphins).

Group B: Underpinning knowledge

Providing a positive customer experience to exercise and fitness participants (J/650/4853)

Unit aim

To provide the essential foundation knowledge for working in exercise and fitness, including knowledge of:

- health, safety and welfare requirements
- supporting customers and participants
- professional practice and regulatory bodies
- business acumen that supports an exercise and fitness business.

Content

1. Understand how to maximise the customer experience in an exercise and fitness environment	
1.1 Explain the essential information an exercise and fitness professional should know about their participants and customers	• Local demographics of an exercise and fitness businesses. • Motivation(s), personal background and health background for screening purposes. • Expectations and aspirations. • How to interpret information to understand customer needs. • How customer and participant information affect the products and services offered.
1.2 Analyse participant expectations and targets within an exercise and fitness environment	• How to interpret customer data to understand the different types of customer needs. • The different requirements of customers, including their expectations and aspirations. • How an exercise and fitness business will meet different types of customer requirements. • How to identify and confirm a customer's expectations. • The importance of responding promptly to a customer seeking assistance.

1.3 Evaluate different methods to obtain participant and customer feedback and channels of recording and reporting in line with relevant procedures	• How to obtain feedback to support participant and membership retention. • The importance of gathering feedback to meet customer expectations. • Different methods to obtain feedback and channels of recording and reporting in line with organisational procedures or own business procedures. • How to interpret information to understand needs.

1.4 Explain methods to manage participant and customer behaviour in a positive and inclusive manner	• Different types of conflict and behaviour issues and how to manage them:
	  ○ conflicts between:
	  – members and other members
	  – members and staff
	  – members and organisation/facility
	  ○ conflicts relating to:
	  – bookings and use of apps to book
	  – equipment out of use
	  – class cancellations
	  – cover teachers and instructions
	  – lack of equipment, broken or out of use
	  – cleanliness
	  – space
	  – people standing in 'their' space (group exercise).
	• Managing conflict:
	  ○ use of listening skills and communication skills.
	  ○ methods to manage participant behaviour in a positive and inclusive manner:
	  – behaviour management strategies to support participant engagement.
	• Learning theories to support personalised learning (visual, auditory, kinaesthetic).

1.5 Explain how an exercise and fitness professional should conduct themselves to portray a professional image	• Present themselves in a professional and approachable manner in accordance with organisational standards. • Show personal attributes required to display a high level of customer service. • Professional membership organisation code of conduct. • Professional demeanour, e.g. uniform and personal attributes, positive first impressions.

1.6 Explain how to build social support and create an inclusive and welcoming environment	• The importance of being accessible and approachable, e.g. walking the gym floor. • How to build social support and inclusion. • Methods to build rapport, e.g. being friendly and approachable. • Respecting equality and diversity. • How to support safe and enjoyable use of an environment or facility.

1.7 Explain how to positively influence a 'customer journey' and improve customer and participant retention	• A typical customer journey in the relevant environment.
	• The impact of the exercise and fitness professional's role on the participant experience.
	• The importance of customer retention and how to influence.
	• Promote a fun, safe and inclusive environment:
	  ○ exemplary customer service skills, e.g. problem solving, discretion, influencing, teamwork, suitable language use, etc.
	  ○ develop rapport with customers
	  ○ friendly and approachable manner
	  ○ respecting equality and diversity
	  ○ support needs, e.g. deliver an informative facility tour
	  ○ deal with enquiries effectively
	  ○ offer an end-to-end service.
	• The feedback cycle and the impact of their role on the customer experience.

1.8 Explain the impact of a positive team culture on the internal and external customer experience	• When working with:
	  ○ internal customers
	  ○ external customers.
	• Impact:
	  ○ inclusion
	  ○ retention
	  ○ satisfaction
	  ○ customer experience.
	• Awareness of roles and responsibilities of self and others involved in the programme, including the client and other staff/professionals.

1.9 Evaluate different methods of communicating with participants and customers	• The importance of regular communication with customers.
	• Methods of communicating:
	  ○ face to face
	  ○ telephone
	  ○ written (letters, email, posters)
	  ○ social media and digital technology.
	• Methods of building rapport and how these influence the customer experience.
	• Different communication techniques and how to use them:
	  ○ observation/non-verbal techniques/body language
	  ○ open and closed questions
	  ○ active listening.
	• How to adapt communication methods to meet the needs of participants for differing backgrounds, cultures, sport/activity experiences, etc.

1.10 Explain the barriers to communication and how to adapt communication effectively to meet the needs of diverse populations	• The importance of communicating effectively with a wide range of people from different cultural and demographic backgrounds.
	• How to adapt communication methods to meet the needs of participants.
	• Barriers and potential solutions:
	  ○ language difficulties
	  ○ level of knowledge, relating to sport and activity experience
	  ○ cultural religions and personal beliefs and/or values
	  ○ demographic and background
	  ○ impairments, e.g. visual, hearing, cognitive.

2. Understand how to maintain health, safety and welfare in an exercise and fitness environment	

2.1 Outline health, safety and welfare requirements relevant to own working role	• Importance:
	  ○ everyone has a responsibility in the environment – etiquette
	  ○ duty of care
	  ○ negligence and commission
	  ○ safety and wellbeing
	  ○ professionalism.

	• Relevant requirements – organisational and national guidelines/legislation:
	  ○ safeguarding
	  ○ risk assessment
	  ○ duty of care
	  ○ managing emergencies
	  ○ reporting procedures – confidentiality, data protection
	  ○ public liability insurance
	  ○ first aid regulations
	  ○ equality and diversity
	  ○ conflict of interest
	  ○ emergency action plans
	  ○ normal operating procedures
	  ○ Control of Substances Hazardous to Health (COSHH)
	  ○ Reporting of injuries, diseases, and dangerous occurrences regulations (RIDDOR)
	  ○ electricity at work regulations
	  ○ personal protective equipment (PPE).
	  ○ equipment storage and maintenance:
	  – manual handling and equipment use
	  – health and safety implications of assembly, dismantling, hygiene and storage of equipment
	  – manufacturer's guidelines and where to locate them.
	• Policies and legislation relating to inclusion and disabled people(s), equity/equality/diversity/social services/adults at risk:
	  ○ the information that needs to be communicated to customers and participants.

2.2 Explain how to carry out a risk assessment and report risks	• The importance of risk assessments.
	• The risk assessment process and procedures relevant to the environment (health and safety executive), including likelihood and severity or risk.
	• How to identify and report hazards relating to:
	  ○ activity areas and gym
	  ○ people
	  ○ physical risks
	  ○ facilities

	○ equipment ○ working practices, including lifting and handling of equipment ○ client behaviour ○ security ○ hygiene ○ security procedures within an exercise and fitness facility. • Risk assessments and reporting procedures. • Maintaining safety of themselves and others. • Control measures appropriate to the environment, activity and people. • How to control risks associated with hazards – eliminate, reduce, isolate, control. • The appropriate person/position to contact within an environment when hazards and risks cannot be controlled personally.
2.3 Explain how to manage emergencies likely to occur in exercise and fitness environment	• The types of emergencies that may occur in an exercise and fitness facility: ○ accidents, e.g. strains and sprains ○ medical emergencies, e.g. drowning, cardiac event. • Typical roles of individuals responsible for health and safety in an exercise and fitness environment. • The importance of following emergency procedures calmly and correctly. • How to maintain the safety of people involved in typical emergencies, including children, older people and disabled people.
2.4 Summarise the procedures and recording documents that should be in place in an exercise and fitness environment to maintain health and safety	• standard operating procedures • emergency action plans (EAP) • organisational policies and procedures • recording documents to include: ○ health screening ○ accident and emergency reporting – RIDDOR, etc. ○ risk assessment, etc.
2.5 Outline the cleaning and maintenance requirements in an exercise and fitness environment	• Principle uses and suitability of: ○ cleaning substances relevant to the environment, e.g. anti-bacterial spray ○ cleaning equipment, e.g. mop, paper towels, etc.

	• Standard operating procedures for routine maintenance and cleaning, adhering to:
	  ○ manufacturer's guidelines
	  ○ Control of Substances Hazardous to Health (COSHH)
	  ○ manual handling
	  ○ electrical safety
	  ○ security and the safe storage of equipment
	  ○ personal protective equipment (PPE)
	  ○ risk assessments
	  ○ emergency action plans.
	• Effective communication with customers and colleagues regarding cleaning.
	• Appropriate signage to identify potential hazards whilst cleaning.
	• How to plan and prepare own cleaning activities relevant to role.
	• How to maintain the safety of themselves and others.
	• Hazardous and non-hazardous waste and how to dispose of it, in line with the organisation's environmental policy.

2.6. Explain the safeguarding requirements relating to own role	• What is meant by safeguarding:
	  ○ children
	  ○ adults and adults at risk.
	• The different types of abuse that an exercise and fitness instructor may encounter.
	• Possible signs of abuse.
	• The responsibilities and limitations of an exercise and fitness instructor.
	• The procedures to follow to protect oneself from accusations of abuse.
	• Organisational procedures and policies:
	  ○ disclosure and barring (DBS)
	  ○ safeguarding adults and adults at risk
	  ○ safeguarding children
	  ○ responsible person for managing safeguarding issues
	  ○ reporting procedures for safeguarding.
	• The statutory agencies responsible for safeguarding.
	• When it may be necessary to contact statutory agencies.

	• How to maintain confidentiality of information relating to possible abuse.

3. Understand professional practice in the exercise and fitness sector	

3.1 Outline guidance provided by governing and/or professional bodies for the sector	• The essential principles, values or ethical codes of practice laid out by governing and/or professional bodies for the sector.
	• Sources:
	  ○ sector bodies
	  ○ national governing bodies (NGB)
	  ○ Health and Safety Executive (HSE)
	  ○ home countries sports councils
	  ○ the Child Protection in Sport Unit (CPSU)
	  ○ government-led independent reviews, for example duty of care.
	• Relating to – working role, scope, boundaries, continuing professional development, health and safety and safeguarding, etc.

3.2 Explain professional ethics related to own role	• Professional membership. • How to work within the role boundaries and scope of own professional knowledge and competence based on qualifications and experience, e.g. additional qualifications needed to programme exercise for children and young people, perinatal individuals, individuals with disabilities, or individuals with long-term conditions. • Representation of skills, abilities and knowledge. • Business practices and professional code of conduct.
3.3 Describe opportunities and requirements for professional development and career progression in the sector	• How to keep knowledge and skills up to date. • Importance of accessing continuous professional development (CPD) relevant to role. • How to access industry-recognised CPD. • How to keep up to date with industry trends. • Relevant legislation/policy and guidelines relating to CPD. • The role of reflective practice and how to complete self-reflection/evaluation to aid personal development.

4. Understand business processes and information technology that can support an exercise and fitness business	

4.1 Outline business planning, finance and marketing relevant to own role	• Components of financial planning that apply to:
	  ○ an organisation.
	  ○ setting up and running a personal health and fitness business (self-employed, partnership, company, community interest or not-for-profit, etc.)
	  ○ components include:
	  - profit and loss
	  - tax and national insurance
	  - liability insurance
	  - music license fees.
	• How IT systems support business operations:
	  ○ finance and accounting
	  ○ marketing and sales
	  ○ record keeping
	  ○ sales and invoicing
	  ○ client and group management
	  ○ class scheduling
	  ○ retention levels
	  ○ session reminders
	  ○ data analysis/interpretation and how to present it.
	• How to store, record and manage data:
	  ○ GDPR and DPA legislation, confidentiality, etc.

4.2 Describe products and services available within an exercise and fitness business and how to support this	• Product offer and services within an organisation or a personal business. • How to upsell and support secondary spends, where appropriate.
4.3 Describe the use of technology and social media within an exercise and fitness business	• The importance of digital media. • How to develop a digital plan. • Social media/digital profiles and their impact. • Different technology to support online delivery. • Current legislation and ethical practice that affects the use of technology: ○ data protection and privacy

	○ intellectual property (IP) ○ patents and copyright. • Technology to support and manage business: ○ record keeping ○ sales and invoicing ○ client and group management ○ class scheduling ○ retention levels ○ session reminders ○ data analysis/interpretation (and how to present it) ○ use appropriate technology to deliver online where appropriate. • Technological advancements to support the customer experience to increase physical activity levels, motivation and focus: ○ wearable technology ○ pedometers ○ mobile phone applications.
4.4 Identify how to set-up a social media/digital profile	• How to set-up a professional social media/digital profile. • Associated risks and benefits.

Principles of physical activity, exercise and training approaches to develop fitness and health (K/650/4854)

Unit aim

To provide essential foundation knowledge regarding the role of physical activity, exercise and different training approaches to develop fitness and health.

Content

1. Understand exercise, physical activity, health and fitness	

1.1 Outline the components of health/total fitness	• Definitions and brief descriptions of:
	  ○ the components of total fitness and health:
	  – emotional
	  – social
	  – nutritional
	  – mental
	  – medical
	  – spiritual
	  – physical
	  ○ the health-related components of physical fitness:
	  – cardiovascular endurance
	  – muscular strength
	  – muscular endurance
	  – flexibility
	  – body composition
	  ○ the skill-related components of physical fitness:
	  – agility
	  – speed
	  – coordination
	  – reaction time
	  – balance
	  – power

	○ the interrelationship between the components of total fitness and those of physical fitness ○ the interrelationship between the components of total fitness in relation to overall health and wellbeing.
1.2 Explain the differences between physical activity, exercise, health and fitness	• Definitions and examples of**:** ○ physical activity – any bodily movement that requires energy expenditure ○ exercise – planned and structured physical activities used to improve one or more components of fitness ○ health – WHO definition ○ fitness: – components of fitness (definitions): ▪ health-related components (see above) ▪ skill-related (see above) – ACSM guidelines for each component ○ national UK guidelines for physical activity and health for different ages - Chief Medical Officer (CMO) ○ the dose-response relationship for physical activity – more is better, move more often ○ the importance of evidence-based practice.
1.3 Explain exercises and approaches to develop the components of physical fitness: • health-related • skill-related.	• Definitions of each component of fitness (as above). • Why each component is needed – benefits and effects for fitness, health and skills: ○ purpose and methods of training flexibility ○ purpose and methods of training muscular fitness ○ purpose and methods of training cardiovascular fitness ○ purpose and methods of training skill-related components. • How to train each component for fitness and health. • Application of ACSM International guidelines for each component. • Application of FITT-VP principles (frequency, intensity, time, type, volume, progression) for each component. • Differences between programming exercise for physical fitness and for health benefits. • How individual goals will affect application and approach. • Goal setting: ○ linked to group needs, wants and motivators

	○ SMART (specific measurable achievable realistic targeted).
1.4 Outline the benefits and effects of different types of exercise on the body systems, including their role in the prevention of health conditions	• Different group exercise class types/genres: ○ kettlebell ○ suspension ○ aqua ○ circuits ○ dance based ○ body conditioning, etc. ○ yoga, Pilates, tai chi ○ walking, running, etc. ○ small groups, large groups, one-to-one (PT). • Gym-based exercise: ○ resistance training (machines, free weights, bodyweight) ○ CV machines training ○ core exercise ○ functional ○ flexibility training, etc. • Components of fitness trained in different genres and approaches. • Benefits of training each component of fitness (see above). • Effects of training each component of fitness (see above): ○ health and wellbeing benefits ○ physiological benefits ○ psychological benefits. • Benefits of different environments: ○ gym based ○ studio based ○ water based/pool ○ sports hall ○ outdoors and different outside spaces, e.g. park, beach, rural, urban ○ home based or confined space. • How to select the most appropriate exercise/exercise modes to meet the needs/goals of the individual/group. • How to communicate the health-related benefits of exercise to clients.

1.5 Describe factors that affect exercise and fitness	• Individual factors:
	  ○ age
	  ○ gender
	  ○ hereditary factors
	  ○ body type
	  ○ muscle fibre type
	  ○ motivation
	  ○ medical health.
	• Lifestyle factors:
	  ○ healthy or unhealthy eating
	  ○ smoking or non-smoking
	  ○ alcohol or no alcohol
	  ○ inactivity/activity
	  ○ sleep
	  ○ stress.

1.6 Outline some of the barriers and motivators to physical activity and exercise	• Real and perceived barriers:
	  ○ physical/social/environmental barriers – cost, accessibility
	  ○ emotional barriers – confidence
	  ○ motivational barriers (likes, dislikes)
	  ○ time barriers – commitments, work, family.
	• Motivators:
	  ○ health
	  ○ social
	  ○ pleasure
	  ○ manage stress
	  ○ aesthetics.

1.7 Outline how technology can be used to support physical activity, exercise, and motivation	• Technological advancements that can support the customer experience to increase physical activity levels, motivation and focus:
	  ○ wearable technology (heart rate monitors, smart watches, etc.)
	  ○ pedometers
	  ○ mobile phone applications.

2. Understand how to structure and design an exercise session	

2.1 Outline how to structure an exercise session	• Structure:
	  ○ warm-up or preparatory phase
	  ○ main component to focus on components of fitness
	  ○ cooldown or closing phase.
	• Selection of exercises for each phase:
	  ○ discipline and genre specific
	  ○ session aims and goals.
	• Realistic timings and sequences for sessions, including:
	  ○ the duration and intensity of components relating to individual factors:
	  – age
	  – health conditions
	  – impairments and disabilities, etc.

2.2 Describe the structure and purpose of a warm-up (preparatory phase)	• Importance and purpose of a warm-up – why needed.
	• A short activity or exercise undertaken prior to a more intensive exercise or activity intended to gradually prepare the body systems for the movement/activities to follow:
	  ○ musculoskeletal, cardiovascular, respiratory, nervous and energy systems.
	• Physiological effects of warm-up – link with anatomy, physiology and body systems.
	• Outline of how to design a warm-up:
	  ○ mobility, warming, muscle lengthening.
	• Factors affecting warm-up design:
	  ○ type of session – group or one-to-one
	  ○ individual factors
	  ○ temperature and environment.

2.3 Describe the structure and purpose of a main component for developing specific components of fitness	• How to design the main component to train:
	  ○ cardiovascular fitness
	  ○ muscular fitness
	  ○ flexibility
	  ○ functional.
	• Physiological effects of different types of training:
	  ○ link with anatomy, physiology and body systems

	○ effect of speed of movement on posture, alignment and intensity. • How different types of exercise session train each component – genre specific. • Components of fitness excluded in some training approaches and the appropriate advice to give: ○ yoga ○ Pilates ○ tai chi ○ walking ○ dance based ○ gym based. • How to programme exercise to develop specific fitness components (See 1.1-1.7). • Overview of specific fitness training techniques: ○ cardiovascular exercise approaches – steady state, interval, fartlek: – heart rate ○ resistance exercise approaches – a range of training systems, exercise equipment, fixed and free weights: – exercises to target major muscles/muscle groups. – the importance of muscle balance ○ functional exercise: movement patterns, muscle actions and components of fitness which mirror a client's functional requirements ○ flexibility exercise: static, ballistic, dynamic and proprioceptive neuromuscular techniques (including the myotatic/stretch reflex) to facilitate increased range of motion.
2.4 Describe the structure and purpose of a cooldown (ending phase)	• Importance and purpose of a cooldown – why it is needed. • Return to pre-activity state: ○ muscle lengthening ○ prevent blood pooling and support venous return. • Physiological effects of cooldown – link with anatomy physiology and body systems. • Brief outline of how to design a cooldown: ○ pulse lowering, muscle stretching. • Factors affecting cooldown design:

	○ type of session – group or one-to-one ○ individual factors ○ temperature and environment.
2.5 Outline how to apply the principles and variables of training to session and programme design	• Principles and variables of fitness/training: ○ FITT-VP principles – frequency, intensity, time, type, volume, progression. • Adaptation, modification and progression for all session components. • Implications of specificity, progressive overload, reversibility, adaptability, individuality, recovery time.

3. Understand methods of monitoring exercise and exercise intensity	
3.1 Describe different methods and approaches to monitoring exercise intensity	• Benefits and limitations of different methods of monitoring exercise intensity: ○ talk test ○ rate of perceived exertion (RPE) ○ heart rate monitoring and the use of different heart rate zones ○ observation.

4. Understand the skills, qualities and behaviours of an exercise instructor	
4.1 Identify the characteristics and qualities of an exercise instructor	• Outline the characteristics of an exercise instructor (consider different exercise genres, populations, and environments). • Ethical and inclusive. • Able to communicate and adapt communication for working with diverse needs. • Friendly, welcoming and approachable personality and positive attitude. • Role model. • Motivational. • Professional. • Work within scope of practice. • A positive attitude and an approachable personality. • The ability to teach and motivate people of all ages and backgrounds. • Good communication skills for explaining techniques and movements clearly.

	• A good level of physical fitness. • A responsible attitude to health and safety. • A flexible attitude to work.

4.2 Describe the skills of an exercise instructor	• Being considerate to different learning styles – visual, auditory and kinaesthetic:
	  ○ demonstrate with correct alignment
	  ○ clear instructions
	  ○ voice projection and intonation.
	• Teaching position, observation and correction:
	  ○ adopting appropriate positions to observe clients and respond to their needs
	  ○ observe and monitor clients to maintain safety and effectiveness
	  ○ correct and improve client exercise technique.
	• Teaching points (verbal and visual):
	  ○ general and specific
	  ○ providing client-specific instruction points, feedback, encouragement and reinforcement in a friendly, professional manner
	  ○ how to provide feedback and instruction points which are timely, clear and motivational
	  ○ how to approach clients in a friendly, non-threatening manner
	  ○ how to work with clients to effectively improve exercise technique.
	• Adapt, regress, progress and apply corrective strategies:
	  ○ modify and adapt exercises for a range of individual needs, e.g. offer alternatives that regress or progress an exercise
	  ○ alternative activities/exercise options.
	• Monitoring the safety and intensity of exercise:
	  ○ awareness of signs of over-exertion/incorrect techniques
	  ○ manipulating FITT principles to ensure progression according to individual needs
	  ○ individual client abilities (fitness levels and any risk factors they may have).
	• How to monitor the safety and intensity of exercise.
	• Awareness of health and safety considerations, e.g. manual handling:

	○ manufacturer guidelines, equipment maintenance and servicing.
4.3 Outline a variety of methods to motivate and encourage participants to perform physical activity and exercise	• Use of communication skills: ○ own demonstration ○ voice projection and tone ○ use of motivational language ○ use of motivational body language. • Consideration of different learning styles – visual, auditory, kinaesthetic. • Consideration of different goals, needs, likes/dislikes.

5. Understand how music can be used to support exercise	
5.1 Describe the psychological effects of using music for exercise	• When music is used and the reasons for its use: ○ advantages/reasons for use: – motivation – distraction from other concerns – create atmosphere, e.g., themed sessions like combat or dance based – set working rhythm/pace/tempo, e.g. resistance or cycling – lift mood, e.g. higher energy or popular tracks – work and rest ratio – circuit or high intensity interval training (HIIT) sessions – relax, slow down and offer focus, e.g. yoga, Pilates – fun and pleasure – feel good factor ○ disadvantages: – can have negative effects on participants' movement and mood – overwork – too motivated – move too fast – small range of motion or exceed range of motion (ROM) – lose control of movements – not be able to keep pace to music – music could be too slow – laboured moves – demotivated if dislike tracks or playlist.

5.2 Identify the legalities of using music	• Different licensing requirements:
	  ○ Phonographic Performance Limited (PPL) and Performing Rights Society (PRS) joined forces in February 2018 to create 'the music license'.
	• Businesses to play recorded music in public spaces.
	• Employed instructors – the fitness centre is responsible for obtaining license to play music, but the instructor is responsible for the music they use (legal):
	  ○ the fee is worked out in accordance with the number of classes on the timetable.
	• Independent exercise instructor, e.g. community halls, responsible for purchasing license.
	• Must play music in its original format only:
	  ○ if app downloaded – use as is
	  ○ if purchased a CD, then not permitted to copy CDs or transfer music into another format.
	• ProDub licence.
	• Companies that create music specifically for group exercise – CDs and downloads.
	• License free music – usually cover versions.
	• Spotify and similar – not legal for public use.

5.3 Outline how music assists in the planning of group exercise sessions	• Timing of session and component. • Pre-recorded work and rest intervals – HITT. • Help control and manage the session. • Support atmosphere and mood.

Health screening, risk stratification and scope of practice (L/650/4855)

Unit aim

To provide the knowledge and skills to:

- preliminarily screen participants
- evaluate the potential risks and benefits of participation in exercise
- assess suitability of exercise for participants within scope of practice
- signpost participants to other professionals.

Content

1. Understand the role of health screening and risk stratification prior to exercise	

1.1 Explain the importance of screening, informed consent and assessment prior to exercise	• Importance and purpose of health screening and risk stratification:
	  ○ the links when working within scope of practice and ensuring client safety
	  ○ to gather relevant health history, current health status, particularly in relation to risk factors for coronary heart disease
	  ○ to identify medical conditions that would necessitate medical clearance or referral to an appropriate medical professional or other clinician or medically supervised exercise programme
	  ○ to identify past and present injuries and disabilities
	  ○ to clarify own scope of practice to client.
	• Screening methods:
	  ○ evidence-based pre-exercise health screening methods: PAR-Q+
	  ○ non-evidence based – organisation/employer devised methods
	  ○ health commitment statement.
	• Verbal screening – when and how to apply, including communication skills:
	  ○ conducted prior to every practical session
	  ○ privacy considerations

	○ how to deal with issues presented that fall outside of scope. • Uses of screening information: ○ when to refer/signpost/take action and what action to take in each circumstance (low, medium, high risk, outside scope of practice) ○ when to defer, e.g. feeling unwell ○ when ready to participate ○ when modifications are needed and what type of modifications. • Purpose and importance of informed consent: ○ prior to sharing information ○ prior to any physical assessment ○ prior to exercise ○ for exercise and assessment, the risks and benefits of participation must be explained and opportunities for questions to be asked given. All information should be recorded, signed and dated. • Purpose and uses of assessment: ○ different types of assessment ○ health and wellbeing: – blood pressure, body mass index (BMI), body composition – lifestyle questionnaires – psychological questionnaires – nutritional assessment tools – food diaries, etc. ○ fitness assessments: – targeted towards components of fitness (CV, strength, flexibility) – functional ADL (activities of daily living) – sit to stand and standing balance, etc. • Use of technology – body stat machines, etc. • Assessments provide baseline information that can determine the appropriateness of the exercises selected. **NB**: All methods should be considered in relation to how effectively they can be applied when instructing different styles of exercise and in different situations, such as employed (leisure centre/private clubs) or freelance/self-employed. Disciplines to include gym based, group exercise and yoga, Pilates, personal training, etc.

1.2 Summarise the information to gather from clients prior to participation in exercise	• Information to include:
	  ○ age and sex (as both are potential cardiovascular disease risk factors)
	  ○ relevant health history
	  ○ current health status, particularly in relation to risk factors for heart disease and identification of medical conditions that would necessitate medical clearance or referral to an appropriate medical professional or other clinician or medically supervised exercise programme, past and present injuries, and disabilities
	  ○ activity experience and preferences
	  ○ fitness and skill level
	  ○ pregnancy
	  ○ reasons for attending – goals, aims
	  ○ barriers and motivators, etc.
	  ○ with consideration of legislation – GDPR/data protection/confidentiality in relation to gathering, storage, using and sharing, including gaining consent for sharing.

1.3 Evaluate the effectiveness of different screening methods and risk stratification tools	• Health screening methods:
	  ○ PAR-Q, PAR-Q+, organisation/employer devised methods, health commitment statement, verbal screening.
	• Other recognised risk stratification tools (Irwin and Morgan traffic light system or other national/international evidence-based tools), national/locally agreed protocols, including referral/care pathways.
	• Consider:
	  ○ validity and reliability of different methods and tools
	  ○ advantages and disadvantages of different methods
	  ○ effectiveness of different methods and extent to which each method:
	  – supports working within scope
	  – maximises individual safety
	  – guides recommendations for participation (ready, defer, refer, etc.)

1.4 Summarise how to use pre-exercise health screening to risk stratify clients	• Use information to identify reasons for inclusion or exclusion:
	  ○ identify absolute contraindications to exercise (exclusion)
	  ○ identify factors that indicate a client is at ‘low, medium or high risk’ of an adverse event occurring during exercise/propensity for risk

	○ what action to take for different risk levels (low, medium, high risk) ○ reasons for temporary deferral of exercise ○ when to refer/signpost/take action: – needs beyond scope of practice – moderate to higher risk stratification.
1.5 Identify the contraindications to exercise	• Definition of contraindicated – risks outweigh benefits. • Definition of controversial – need to evaluate risks/benefits: ○ consideration of: – individual needs and information gathered – risks of exercise – injuries through to medical emergencies, e.g. sprains, strains, fainting, hypoglycaemia, heart attack – benefits of exercise for health and fitness. • Absolute contraindications for exercise (general) – use ACSM 'Guidelines for exercise testing and prescription'. • British Heart Foundation National Centre (BHFNC) 2010 'Exercise referral toolkit' (currently being revised): ○ any uncontrolled or unstable medical condition, e.g. not managed by medication ○ resting systolic blood pressure at (or above) 180mmhg/DBP 100mmhg ○ uncontrolled resting tachycardia at or above 120 bpm ○ experiences a negative change or increase in pain during exertion ○ dizziness or excessive breathlessness during exertion. • Reference to the current American College of Sports Medicine guidelines for specific conditions (use of PAR-Q+ and algorithm). • Other reference sources: ○ absolute contraindications specific to different disabilities and health conditions – use ACSM reference source – 'Exercise management for persons with chronic diseases and disabilities'. ○ Perinatal – use guidelines from Royal College of Obstetricians and Gynaecologists (RCOG), American College of Obstetricians and Gynecologists (ACOG).
1.6 Explain own scope of practice and when to	The scope of practice is explained as:

signpost clients to other specialists for appropriate support	• Working within own level of competence – knowledge, skills, experience, exercise genre delivery and participants' needs (risk stratification).
	• Working within own level of confidence – if in doubt, signposting may be safest decision.
	• Ensures professional and ethical practice.
	• Refer or signpost to other specialists when needs exceed scope of practice:
	  ○ alternative sources of advice and support to whom you can defer/refer the individual
	  ○ how and when to make referrals into the leisure industry.

1.7 Outline how to provide advice and guidance to support clients	• Positive, motivating and empowering approach. • Use of effective communication skills. • Sensitivity and respect, honesty, transparency. • Emphasis on participant safety. • Credible advice and guidance appropriate to own level of expertise. • Be an ambassador for the sector, leading by example. • Clarify the role and responsibilities of all involved in the programme.

2. Be able to use information to risk stratify clients and provide appropriate advice regarding participation in exercise	
2.1 Analyse pre-exercise screening and lifestyle information to assess a client's readiness to exercise and make lifestyle changes	• See 1 above. • Information to be applied in all subsequent practical assessments and client work (plan and deliver and consultation units).
2.2 Use risk stratification to assess risks of participation in exercise	• See 1 above. • Information to be applied in all subsequent practical assessments and client work (plan and deliver and consultation units).
2.3 Outline individual needs outside of scope	• See 1 above. • Information to be applied in all subsequent practical assessments and client work (plan and deliver and consultation units).

2.4 Analyse client information and make appropriate recommendations regarding participation	• Informed and educated decision making to advise:
	  ○ when to participate
	  ○ when to defer
	  ○ when to signpost or refer
	  ○ who to refer to:
	  – other specialist exercise professionals
	  – medical professionals.
	• Ways to overcome any barriers to participation using appropriate motivational strategies, where practicable.
	• Information to be applied in all subsequent practical assessments and client work (plan and deliver consultation units).

2.5 Provide advice and guidance within scope of practice to support clients	• Advice and guidance relating to:
	  ○ participation in exercise and activity
	  ○ lifestyle changes
	  ○ healthy eating
	  ○ reasons for referral or deferral of exercise
	  ○ services and sessions that meet individual needs
	  ○ the roles and responsibilities of others who may be involved in the programme.
	• Information to be applied in all subsequent practical assessments and client work (plan and deliver and consultation units).

Health awareness and lifestyle management (R/650/4857)

Unit aim

To provide knowledge of lifestyle factors that influence health and increase the risk for the development of long-term health conditions, and how these can be managed.

Content

1. Understand components of a healthy lifestyle and factors that affect health and wellbeing	
1.1 Describe the interrelationship of the components of health and total fitness in supporting wellbeing	• Each component is interrelated and may impact others; some basic examples are: ○ physical fitness can influence medical health and vice versa ○ mental and emotional health can influence motivation to participate in exercise, e.g. those with more severe long-term mental health conditions are often less active ○ social fitness can influence mental health, e.g. effects of isolation. It can also influence physical fitness, e.g. friends and family can support or discourage participation in activity, which influences physical fitness ○ medical health conditions will affect the appropriateness of some types of exercise ○ nutritional fitness and diet will affect physical performance and medical health ○ spiritual fitness and belief systems will influence lifestyle choices that impact health, e.g. choosing to be active, effects of religious dietary practices on eating behaviours, etc. ○ other examples of balance and imbalance: – athletes may have high levels of physical fitness but may not be healthy, e.g. eating disorders (medical and mental/emotional health affected) – bodybuilders prioritise aesthetics over function and health – fitness models – individuals may have a social network, but the network may or may not support healthy

	lifestyle choices that affect each component, e.g. physical, medical, etc.

1.2 Describe the effect of lifestyle on health and wellbeing	• Components of a healthy and unhealthy lifestyle.
	• Effects of the following on the body systems (link with anatomy and physiology):
	  ○ smoking – not smoking
	  ○ alcohol – no alcohol
	  ○ healthy eating – unhealthy eating
	  ○ physical activity levels and preferences and physical inactivity
	  ○ weight management
	  ○ rest and relaxation, relaxation training
	  ○ stress (signs, symptoms, effects, and management)
	  ○ work patterns/job
	  ○ relevant personal circumstances – life, work, relationships, etc.
	• The UK physical activity guidelines for different ages and the dose-response relationship.
	• The benefits of physical activity/exercise to health and wellbeing.

2. Understand principles of nutrition and healthy eating	

2.1 Describe healthy eating advice recommended by the national food guide model	• Current government healthy eating guidelines and evidence-based recommendations, i.e. 'The Eatwell Guide':
	  ○ at least five portions fruit and vegetables every day.
	  ○ all meals based around starchy carbohydrates.
	  ○ some dairy or dairy alternatives – lower fat and sugar options
	  ○ some beans, pulses, fish, eggs, meat and other proteins
	  ○ two portions of fish every week (one should be oily)
	  ○ choose unsaturated oils and spreads and eat in small amounts
	  ○ drink six to eight cups/glasses of fluid a day
	  ○ small and infrequent consumption of food/drinks high in fat, salt or sugar.

2.2 Outline the dietary role and food sources of the main macronutrients and micronutrients	• The main macronutrients and micronutrients and their dietary role and function. • Food sources of carbohydrate (including fibre and gut health), fats (saturated, unsaturated, essential fatty acids), protein, vitamins, minerals, water. • Calorific value of nutrients.
2.3 Explain the importance of adequate hydration	• Best sources to stay hydrated. • Different types of drinks – isotonic, hypotonic, etc. • Risks of dehydration. • Signs and symptoms of dehydration.
2.4 Outline scope of practice for providing healthy eating advice	• Signpost to current government healthy eating guidelines and evidence-based recommendations. • Nutritional advice and guidance and diets are the role of a dietitian and should always be signposted.

2.5 Describe the energy balance equation	• Energy in (EI) components, e.g. food.
	• Energy out (EO) components, e.g. physical activity, resting metabolic rate or RMR).
	• How EI and EO may influence:
	  ○ weight management
	  ○ weight loss
	  ○ weight gain.

2.6 Identify the relationship between nutrition and health	• Health risks of unhealthy eating and poor nutrition:
	  ○ obesity
	  ○ cholesterol
	  ○ type 2 diabetes
	  ○ mood changes.
	• Health risks of alcohol (including calorific value of alcohol).
	• Health risks of excess caffeine.

3. Understand a range of health conditions and medically controlled diseases influenced by lifestyle	

3.1 Describe the role of physical activity in the prevention and management of health conditions and medically controlled diseases	• Reference to chief medical officer (CMO) reports and the benefits of exercise in preventing health conditions.
	• Common conditions and diseases:
	  ○ obesity
	  ○ osteoporosis
	  ○ mental health – stress/depression/anxiety
	  ○ back pain
	  ○ hypertension
	  ○ angina
	  ○ coronary heart disease (CHD)
	  ○ pre-diabetes and diabetes
	  ○ prevalent forms of arthritis
	  ○ stroke
	  ○ cancer
	  ○ asthma
	  ○ chronic obstructive pulmonary disease (COPD)
	  ○ asthma
	  ○ chronic fatigue
	  ○ eating disorders.
	• With consideration of:
	  ○ prevalence and implications for UK population, e.g. populations typically affected
	  ○ causes/risk factors of conditions
	  ○ signs and symptoms of conditions
	  ○ preventative effects of exercise
	  ○ how activity can support management of conditions
	  ○ scope of practice boundaries and links with risk stratification.

3.2 Summarise the risks and benefits of exercise and physical activity associated with different health conditions	• Benefits – how physical activity/exercise can help to prevent and manage common health conditions. • Risks of activity and exercise, e.g. strains, sprains, hypoglycaemia, cardiac arrest, fainting, asthma attack. • Risks associated with exercise for specific health conditions (as above) but greater risk for some individuals (links with risk stratification). • The importance of working within scope of practice.

3.3 Outline how to research medical conditions in relation to exercise participation and advice	• How to seek evidence-based/reputable health and wellbeing advice.
	• Credible and reputable information sources and research methods:
	  ○ National Institute for Health and Care Excellence (NICE)
	  ○ World Health Organisation (WHO)
	  ○ National Health Service (NHS).
	• Importance of evidence-based practice.
	• Importance of scope of practice and maintaining boundaries.

4. Understand psychological factors influencing lifestyle and behaviour change	

4.1 Describe psychological factors that can influence lifestyle choices and behaviour change	• Socio-economic and environmental factors:
	  ○ education
	  ○ housing
	  ○ poverty
	  ○ employment, etc.
	• Psychological factors that can influence lifestyle choices and behaviour change:
	  ○ intrinsic and extrinsic motivation and role in motivation and adherence to exercise and lifestyle behaviour change
	  ○ social support and peer pressure
	  ○ individual client needs and differences:
	  – experienced, inexperienced
	  – active and inactive.

4.2 Describe motivations and barriers to exercise and lifestyle change	• Barriers to change:
	  ○ perceived and actual barriers – social, environmental, financial, psychological
	  ○ self-recognition of own barriers

	○ reinforcement. • Motivators: ○ health ○ self-determination ○ self-efficacy. • Use of psychological questionnaires to assess readiness to change and motivation.

5. Understand theories and strategies to support positive behaviour change	
5.1 Summarise the key concepts of a range of behaviour change theories and approaches and how they can motivate positive lifestyle behaviour change	• Key concepts of: ○ arousal theories ○ stages of change/transtheoretical model (TTM) ○ motivational interviewing ○ the COM-B model, which links with long term conditions ○ positive psychology, which links with long term conditions.
5.2 Describe how to identify a client's readiness to change	• Characteristics at different stages ○ precontemplation – not thinking about change ○ contemplation – weighing up benefits ○ preparation – starter preparation ○ action – changes commenced – less than six months ○ maintenance – changes sustained for longer than six months ○ termination – old behaviour deleted ○ lapse – short-term lapse from change process ○ relapse – return to old behaviour ("fall off the wagon").
5.3 Summarise appropriate interventions/strategies to support clients with lifestyle change, including the use of technology	• How to educate clients on the components of a healthy lifestyle. • Why it is important for a client to take personal responsibility for their own health, fitness and motivation. • A range of appropriate interventions and strategies to use at each stage: ○ decisional balance sheet/pros and cons/cost benefit analysis ○ psychological readiness scales ○ fitness testing

	○ overcoming barriers ○ goal setting – how to set and review smart goals, short and long term, process and outcome, etc. ○ behavioural modification techniques ○ planning for relapse/contingency planning, rewards, focusing ○ support systems ○ reinforcement strategies ○ self-monitoring. • Technological advancements that can be used to support motivation and focus: ○ text, Teams, Zoom, email ○ wearable technology ○ pedometers. • Mobile phone applications, e.g. those that link with wellbeing outcomes from body scan assessments.
5.4 Explain professional role boundaries and scope of practice in relation to offering lifestyle advice	• Own role boundaries and scope of practice in physical activity and exercise. • When and how to signpost to other health professionals who can support individuals: ○ general practitioner (GP) – responsible for all referrals to other services ○ counsellor – stress, mental health ○ smoking cessation ○ alcohol and drug support.

Group C: Gym Instructing

Supporting clients in a gym-based environment (T/650/4858)

Unit aim

To develop the skills to support clients in a gym-based environment, including:

- pre-exercise screening
- inducting clients in the use of gym-based equipment
- conducting gym tours
- supervising clients
- maintaining health, safety and hygiene.

Content

1. Understand consultation, assessment and induction processes in a gym-based environment	
1.1 Outline how to conduct a tour of the gym facility	• The difference between a facility show around and an induction. • Professional conduct and how to portray a positive image. • Introduction as part of the customer experience/customer journey. • Show client the full range of activities/services/classes across the facility: ○ booking apps. • Establish the client's own goals/motivations. • Promote the organisation's mission statement and commitment to its customers. • Build rapport. • Answer any questions/concerns. • Educate client about own role, responsibilities and limitations in providing assistance (scope of practice), including gym etiquette. • How to adapt inductions for individuals and small groups (maximum of five) to maintain effectiveness. • The full range of activities/services/classes across the facility available to clients and how to provide further information about them.

	• Different demographics/fitness levels/goals of clients and how best to cater for their differing needs.
	• Relevance of data protection and client confidentiality.
	• Organisation's customer charter/service promise and the importance of striving to exceed it.
	• Related products, systems and technology, e.g. class booking apps, that help to enhance the customer experience.
	• Adherence to appropriate legislation, guidelines and organisational procedures:
	  ○ data protection, client confidentiality, conflict of interest
	  ○ health and safety at work
	  ○ Disclosure and Barring Service (DBS)
	  ○ safeguarding children, adults and adults at risk
	  ○ equality and diversity
	  ○ personal liability insurance
	  ○ normal operating procedures (NOPs)
	  ○ organisation emergency action plans (EAPs)
	  ○ importance of risk assessment and how to conduct it
	  ○ storage plans and how to create one.

1.2 Explain the purpose of a client consultation/assessment prior to participation in gym-based exercise	• To gather information about the client:
	  ○ establish their goals/motivations
	  ○ use of valid and reliable health screening tools to check suitability/readiness to exercise:
	  – reasons for referral or deferral
	  – risk stratification and use of models, e.g. Irwin and Morgan, ACSM Algorithm, PAR-Q+
	  – clarify own scope of practice
	  ○ identify any barriers to certain activities which they may have
	  ○ obtain base line information from which improvements can be measured and monitored
	  ○ the significance of the consultation as part of the customer experience/customer journey
	  ○ importance of educating client about own role, responsibilities and limitations in providing assistance (scope of practice).

1.3 Describe consultation and assessment methods to obtain information about the client	Methods**:**
	• Screening questionnaire, e.g. PAR-Q+.
	• Lifestyle consultation and use of questions or questionnaires (EQ5D):
	  ○ previous and current level of activity
	  ○ exercise likes/dislikes
	  ○ barriers to exercise
	  ○ motivations
	  ○ food diaries or 24-hour recall for dietary analysis and guidance.
	• Other assessments – relevant to client and gym protocols:
	  ○ observation – posture:
	  – progress photographs, if desired.
	  ○ static and dynamic fitness assessments/measurements:
	  – blood pressure (electrical and manual)
	  – body fat measurement (bioelectrical impedance and skinfold callipers)
	  – body mass index (height and weight)
	  – waist to hip measurements
	  – muscular strength and endurance (repetition maximums, bodyweight tests, e.g. press-ups, squats, lunges, plank, side plank, abdominal crunches)
	  – range of movement tests (sit and reach test, hamstring, shoulder flexibility, knee to wall test)
	  – cardiovascular tests (cooper run, machine-based time tests, e.g., cycle/row set distance as quick as possible, Rockport walk)
	  – balance tests (standing balance test)
	  ○ psychological questionnaires
	  ○ technology – body scanning devices.
	• Contraindications and limitations for testing.
	• Informed consent/client agreement prior to any assessment and exercise programme.
	• Referral process, if required:
	  ○ the correct procedures to follow and how to inform clients.

1.4 Describe communication skills to gather information from the client	• Communication skills:
	  ○ verbal – language used, voice tone, voice volume
	  ○ listening skills – active and reflective listening
	  ○ non-verbal skills – eye contact, body language, posture, gestures, etc.
	• Consultation environment:
	  ○ portray a professional image
	  ○ private
	  ○ all equipment and paperwork available.

1.5 Describe how to induct individual clients to specific exercises and equipment in the gym environment	• Screening to check readiness prior to induction.
	• Use of appropriate teaching sequences:
	  ○ IDEA (identify, demonstrate, explain, activity/application)
	  ○ NAMSET (name, area of body trained, muscles used, silent demonstration, explanation, teaching points).
	• Consideration of different learning styles – visual, auditory and kinaesthetic.
	• Application of appropriate teaching skills – demonstration, explanation, teaching position, etc.
	• Health and safety considerations:
	  ○ instruction of appropriate equipment set-up and technique
	  ○ use of manufacturer guidelines
	  ○ manual handling
	  ○ storage and packing away after use.
	• Equipment and exercises to induct:
	  ○ cardiovascular machines
	  ○ fixed resistance machines
	  ○ free weights
	  ○ bodyweight exercises
	  ○ small equipment – steps
	  ○ lifting and passing (when relevant)
	  ○ warm-up exercises
	  ○ cooldown exercises
	  ○ methods of monitoring intensity
	  ○ variables to intensity on different equipment, e.g. speed, level.

	NB: See Appendix 1 for exercise list examples.
	• Adherence to appropriate legislation, guidelines and organisational procedures:
	  ○ data protection, client confidentiality, conflict of interest
	  ○ health and safety at work
	  ○ Disclosure and Barring Service (DBS)
	  ○ safeguarding children, adults and adults at risk
	  ○ equality and diversity
	  ○ personal liability insurance
	  ○ normal operating procedures (NOPs)
	  ○ organisation emergency action plans (EAPs): importance of risk assessment and how to conduct it
	  ○ understand storage plans and how to create one.
	• Ask if any questions.

1.6 Outline how to adapt the induction process when working with small groups	• Main modifications to induction skills, such as:
	  ○ teaching position for demonstrations
	  ○ voice projection when working with larger numbers
	  ○ maintaining the engagement of all individuals
	  ○ eye contact with all individuals
	  ○ allowing all individuals time to practice.

1.7 Explain how to record and use information to plan and review client progress	• Information gathered will inform planning and delivery (see the 'Plan, deliver and evaluate gym-based training' (Y/650/4859) unit:
	  ○ risk stratification – low, medium, high
	  ○ reasons for exclusion and signposting/referral or temporary deferral
	  ○ exercise selection and type
	  ○ duration and intensity of specific components
	  ○ equipment inducted
	  ○ record information in accordance with organisation procedures and relevant legislation, e.g. data protection, GDPR, confidentiality, etc.
	  ○ methods which could be used to review client(s)' progress:
	  – questionnaires
	  – interview/consultation
	  – observation

	– repeating previous measurements to ascertain progress (comparison with baseline). • Why it is important to review client(s)' progress at regular intervals: – client(s)' progress towards goals and planned targets – redefining and setting new goals – checking the appropriateness of the programme content for each client – ascertaining how well the programme and the exercises meet client(s)' needs – client(s)' progress against planned targets at agreed intervals – checking that client(s) is/are happy with the programme – increasing adherence to the lifestyle change – reducing failure or dropout – providing regular support – identifying barriers and providing potential solutions – providing positive praise and encouragement – providing external rewards – identifying internal motivators.

2. Be able to conduct consultations, assessments and inductions in a gym-based environment	

2.1 Introduce client(s) to the gym environment.	• See 1 above.
	• Engage client(s) from the outset using effective communication to help them feel welcome and at ease (adapting as necessary for small groups):
	  ○ walk-through/show-round of facilities:
	  – gym floor
	  – class/spin studios
	  – toilets
	  – fire exits, etc.
	  – gym etiquette – clean machines after use, etc.
	  ○ introduce to colleagues (as appropriate)
	  ○ appropriate consideration of health and safety
	  ○ provision of duty of care.

2.2 Use effective communication skills to obtain relevant information about the client	• Suitable environment. • Use effective communication methods. • Information to include – PAR-Q+, activity experience and likes and dislikes, etc. • Positive customer experience. • Give positive, motivating and relevant feedback. • Engage and build rapport.
2.3 Use appropriate screening and assessment methods to obtain relevant information about the client	• Assess the readiness to participate. • Assessment relevant to needs. • Risk stratification and appropriate advice.

2.4 Induct individual clients to specific exercises and equipment in the gym environment	• Induction of equipment to include:
	  ○ pre-screening to assess readiness
	  ○ use of appropriate teaching sequences:
	  – IDEA (identify, demonstrate, explain, activity/application)
	  – NAMSET (name, area of body trained, muscles used, silent demonstration, explanation, teaching points)

	○ consideration of different learning styles – visual, auditory and kinaesthetic ○ application of appropriate teaching skills – demonstration, explanation, teaching position, etc. ○ health and safety checks ○ equipment and exercises to induct: – cardiovascular machines – fixed resistance machines – free weights – bodyweight exercises – warm-up exercises – cooldown exercises – methods of monitoring intensity – variables to intensity on different equipment, e.g. speed, level. **See** Appendix 1 and LAR for exercises to be inducted.
2.5 Induct small groups of clients to specific exercises and equipment in the gym environment	• As previous but using modifications to communication and induction skills to accommodate small groups. • See also 1.
2.6 Record and store client information appropriately	• Consideration of organisational policies and legislation (GDPR/DPA, etc.). • To enable use for planning and review.

3. Know how to supervise and maintain safety and hygiene in the gym-based environment	
3.1 Describe how to supervise the gym environment	• Should be specific to the facility and may include: ○ creating a positive, motivating and empowering environment that supports clients to safely participate in and adhere to exercise by: – adopting appropriate positions to observe and monitor gym clients to ensure the safety and effectiveness of exercise at all times – knowing how and when to proactively engage with clients: ▪ monitoring technique with regard to the safety and intensity of exercises

	▪ approaching clients in a friendly, non-threatening manner ▪ timing interactions appropriately, avoiding any interruptions which could affect client's training and focus ▪ modifying and adapting exercises for a range of individual needs, offering alternatives that regress or progress an exercise ▪ providing feedback and instruction points which are timely, clear and motivational – supporting clients by recognising and developing their intrinsic and extrinsic motivation to exercise – offering credible advice and guidance appropriate to own level of expertise to promote positive healthy lifestyle choices. ○ having an awareness of health and safety considerations with regard to: – manual handling – equipment: ▪ manufacturer guidelines ▪ maintenance and servicing. ○ how to: – provide duty of care to customers – support equality and diversity – collaborate and work with others, e.g. handover information – use wearable technology to support safe and effective gym-based exercise.
3.2 Describe cleaning procedures for the gym environment	• Should be specific to the facility and must cover: ○ the principle uses and suitability of a range of cleaning substances relevant to the gym environment, e.g. anti-bacterial spray ○ the principle uses and suitability of a range of cleaning equipment, e.g. mop, paper towels, etc. ○ standard operating procedures with regards to routine maintenance and cleaning, adhering to: – manufacturer's guidelines. – Control of Substances Hazardous to Health (COSHH)

	– manual handling techniques – electrical safety and security and safe storage of equipment – personal protective equipment, risk assessments and emergency action plans ○ how to identify hazards relating to: – activity areas and gym – people, physical risks ○ risk assessments and reporting procedures ○ cleaning routines and organisational standards relevant to the gym environment ○ how to maintain the safety of themselves and others ○ different types of waste, e.g. hazardous and non-hazardous and how to dispose of it, in line with the organisation's environmental policy.

4. Be able to supervise and maintain safety and hygiene in the gym-based environment	
4.1 Supervise the gym environment	• See 3. • Work alone and as part of a team. • Credible advice and guidance. • Fulfil responsibilities, e.g. cleaning, identifying and reporting hazards. • Supporting gym-users. • Duty of care. • Communication with gym-users.
4.2 Provide appropriate support and guidance to gym users	• See 3. • As required: ○ walk the gym floor. ○ monitor and review the effectiveness of gym-based exercise programmes. ○ carry out regular programme review meetings with clients to ascertain how well the exercise programme meets client needs/progress towards goals, any improvements that can be made to the programme plan, etc. ○ signpost clients to other aspects of the facility if they show an interest in other areas/activities ○ offer advice and guidance to clients

	○ evaluate planned programmes to ensure the physical and psychological needs of the individual are being met ○ propose changes/adaptations to the session based on the appraisal of own performance.
4.3 Maintain cleanliness and hygiene in the gym environment	• Plan and prepare own cleaning activities through the interpretation of the organisation's daily cleaning schedule. • Demonstrate suitable use of appropriate cleaning substances and equipment in line with the organisation's safe systems of work, cleaning schedules and organisational standards, whilst maintaining the safety of themselves and others: ○ maintain duty of care ○ comply with legislation. • Demonstrate appropriate action to deal with identified hazards, to include appropriate use of signage and reporting procedures. • Demonstrate effective communication to customers and colleagues whilst cleaning to ensure a positive customer experience.

Plan, deliver and evaluate gym-based training (Y/650/4859)

Unit aim

To develop the knowledge and skills required to safely and effectively plan, deliver and review gym-based exercise programmes (within scope of practice).

Content

1. Understand how to use client information to plan gym-based exercise	

1.1 Outline how client information affects the planning of gym-based exercise	• Overall aims of the exercise programme.
	• Results of a health/fitness assessment.
	• Goal setting and monitoring, e.g. SMART goals, process and outcome goals, short-, medium- and long-term goals:
	  ○ health or fitness or other
	  ○ components of fitness trained
	  ○ application of principles and variables of training.
	• Programming:
	  ○ session structure and intensity, duration of specific components
	  ○ exercise selection – type:
	  – muscle balance
	  ○ equipment used to meet goals.
	• Awareness of the risks of participation and adaptations needed (where appropriate) to minimise risks.
	• Adaptations to plans/exercises in response to feedback and reviews.
	• Provision of alternatives.
	• Possible referral and signposting to other services.

1.2 Identify possible reasons for temporary deferral or referral of exercise	• Medical/injury history. • A positive (yes) answer on the PAR-Q+ and yes response to follow-on questions. • Special population(s) with specific needs for which the instructor is not qualified. • Moderate to higher level risk stratification (Irwin and Morgan or ACSM algorithm).

<table>
<tr><th colspan="2">2. Understand how to plan, deliver and review gym-based exercise for a range of clients</th></tr>
<tr><td>2.1 Outline how to plan and adapt gym-based exercise for a range of clients within scope of practice</td><td>

For apparently healthy client (scope of practice):

use information gathered during a consultation and assessment:

different objectives:

health
fitness
social
specific fitness goals
weight management

exercise likes/dislikes
results of any assessment tests
availability (number of days per week available to train)
barriers to participation and adherence.

appropriate recording and storage of information, e.g. GDPR, data protection.

</td></tr>
<tr><td>2.2 Identify a range of exercises and methods of training</td><td>

Warm-up exercises and equipment.
Cooldown exercises and equipment.

<table>
<tr><th>Method</th><th>Approach</th><th>Equipment</th></tr>
<tr><td>Cardiovascular training</td><td>continuous
interval
fartlek
HIIT</td><td>upright cycle
recumbent cycle
treadmill
stepper
rowing machine
elliptical trainer/cross-trainer</td></tr>
<tr><td>Resistance training methods</td><td>single set training
circuit resistance training
basic sets
Delorme and Watkins 10 RM system
Berger 6 RM system</td><td>free weights
fixed weights
bodyweight
lifting and passing and spotting methods</td></tr>
</table>
</td></tr>
</table>

	• super-sets	

Method	Approach
Functional exercise	• movement patterns • muscle actions • components of fitness required for ADLs
Flexibility:	• static stretching • mobilisation of joints • preparatory stretches (during the warm-up – static/dynamic) • post-workout stretches (maintenance and developmental)
Motor skills:	• balance • power • speed • reaction time • coordination • agility

2.3 Interpret individual client information to select gym-based exercises that will help clients to develop: • cardiovascular fitness • muscular fitness • flexibility • motor skills and functional ability	• Interpret and use information obtained during a health/fitness assessment to make appropriate recommendations and plan session(s) to meet individual needs.

2.4 Use information obtained to create a safe and effective gym-based exercise programme	• Relevant:
	  ○ targeted towards client goals
	  ○ safe

	○ includes any necessary adjustments due to limitations identified during consultation/assessment. • Content: ○ clear and understandable layout ○ key points of an exercise using written/diagrammatic explanations, where appropriate ○ realistic timings and sequences for exercise ○ balanced according to individual goals in order for adaptations to occur ○ minimise any risks relevant to the programme ○ dates added for when reviews are to be conducted. • Format: ○ written ○ online ○ electronic.
2.5 Describe the instruction and communication skills required to deliver gym-based exercise	Instruction and communication skills to include: • Verbal screening to start every session. • Safe and effective exercise demonstrations for a range of available equipment to cover: ○ CV machines ○ machine and free weights ○ small equipment. • Engagement with clients to ensure safety and effectiveness. • Using explanations and demonstrations that are technically correct, safe and appropriate to the individual. • Observation of client(s)' movement, correcting exercise technique to ensure safe and effective alignment, execution and use of equipment. • Ability to provide client-specific instruction points, feedback, encouragement and reinforcement in a friendly, professional manner. • Offering adaptations and alternatives that meet a client's individual needs whilst improving performance (progression, regression, corrective strategies and alternative exercises, as required). • Adopting appropriate positions to observe clients and respond to their needs. • Monitoring the safety and intensity of exercise. • Manipulating FITT principles to ensure progression, according to individual needs.

2.6 Describe methods of monitoring intensity during gym-based exercise	• Benefits and limitations of:
	  ○ talk test
	  ○ rating of perceived exertion
	  ○ heart rate monitoring
	  ○ use of CV machine scanning/target heart rate zones and calories burned figures
	  ○ observation.

3. Be able to plan, deliver and review gym-based exercise sessions	
3.1 Plan a safe and effective gym-based session	Appropriate to client(s)' needs and information gathered – see consultation and assessment - LO1 and 2 (in Supporting clients in a gym-based environment unit (T/650/4858) • for details on information gathered. • Goal setting. • Exercise selection and session structure.
3.2 Assess, monitor and manage risks throughout the session	• Identify and respond to hazards to ensure duty of care.
3.3 Demonstrate effective instruction and communication skills	• See 2. • Verbal screening to start sessions. • Motivational skills to empower clients. • Correct technique. • Coaching/teaching/instruction methods which cater for different learning styles – visual, auditory and kinaesthetic. • Communication methods appropriate to client.

3.4 Demonstrate safe and effective technique and instruction for a range of gym-based exercises/activities	• Introducing and concluding the session, including gathering feedback.
	• Warm-ups and cooldowns.
	• CV machines.
	• Bodyweight exercises.
	• Resistance machines:
	  ○ range of motion
	  ○ speed/rate
	  ○ joint alignment.

	• Free weights:
	  ○ lifting
	  ○ passing
	  ○ spotting technique.
	• Small equipment:
	  ○ use of mats for core/abdominal exercise, etc.
	• Functional exercise and functional equipment (exercises that address the movement patterns/muscle actions/components of fitness required for activities of daily living).
	• Flexibility and range of motion exercises:
	  ○ static stretching
	  ○ mobilisation of joints.

3.5 Monitor and observe gym clients to ensure their safety and effectiveness of exercises	• Monitoring of exercise intensity using appropriate methods. • Monitoring of exercise safety, effectiveness and individual technique. • Use of explanations and demonstrations that are technically correct, safe and appropriate to the individual client. • Observing client(s)' movement, correcting exercise technique to ensure safe and effective alignment, execution and use of equipment. • Providing client(s) specific instruction points, feedback, encouragement and reinforcement in a friendly, non-confrontational and professional manner. • Adapting coaching/teaching/instructing methods to cater for different learning styles – visual, auditory and kinaesthetic. • Offering adaptations and alternatives that meet a client's individual needs whilst improving performance, i.e. progression, regression, corrective strategies and alternative exercises, as required. • Adopting appropriate positions to observe client(s) and respond to their needs. • Manipulating FITT principles to ensure progression according to individual needs where/when required.
3.6 Improve client's performance	• Offering specific advice to support exercise technique. • Ensuring client(s) know how to perform programme without direct supervision.

3.7 Evaluate the effectiveness of the session to ensure it is engaging, varied and meets client(s)' needs/goals	• How to gather and use information and the benefit of conducting evaluation(s):
	  ○ information gathering sources (questionnaires, comment slips, verbal)
	  ○ sources of information (self, participants, supervisors, peers)
	  ○ discussion of information with relevant personnel (studio coordinator/line manager).
	• Use of the Kolb cycle to evaluate.
	• Carrying out regular programme review meetings with client(s) to ascertain how well the exercise programme met client(s) needs/progress towards goals, any improvements that can be made to the programme plan, etc.
	• Evaluating and reflecting on planned programmes to ensure the physical and psychological needs of the individual are being met.
	• Monitor and review the outcomes of working with participants and taking into consideration participant feedback:
	  ○ gathering feedback from client(s) in verbal or written formats
	  ○ accepting feedback objectively
	  ○ offering credible advice and guidance appropriate to own level of expertise to promote positive healthy lifestyle choices
	  ○ signposting client(s) to other services if they show an interest in other areas/activities.
	• Identify:
	  ○ strengths and areas to develop
	  ○ ways to make improvements
	  ○ how well the exercises met client(s)' needs
	  ○ the effectiveness of session structure and equipment for meeting participant needs
	  ○ how effective and motivational the relationship with the client(s) was
	  ○ how well the instruction and communication style matched client(s)' needs
	  ○ the safety and effectiveness of programme and exercises; things that went well as well as things to improve
	  ○ changes/adaptations to the session based on the appraisal of own performance
	  ○ support needed, e.g. mentor, training, etc.

3.8 Outline how to use information to improve personal practice	• The value of reflective practice:
	  ○ appraising and improving own performance and clients' performance
	  ○ retaining clients
	  ○ aiding personal development
	  ○ meeting clients' expectations
	  ○ ensuring programmes are safe and effective
	  ○ identifying specific improvements to instructional skills and communication
	  ○ identifying ways to improve session content for meeting participant needs, to include:
	  – adaptation of plans to accommodate specific needs the clients may present
	  – selection of exercises that are safe, effective and reflect current guidelines for good practice
	  – provision of alternatives
	  – providing advice to client(s) regarding safe and effective alignment of exercise positions.

Group D: Group Exercise Instructing

Plan, deliver and evaluate group circuit training (F/650/4860)

Unit aim

To develop the knowledge and skills required to safely and effectively plan, deliver and review group circuit training, within scope of practice.

Learners will:

- induct circuit exercises/stations
- manage group behaviour
- demonstrate effective communication and instructional skills
- engage and fully support a range of participants.

Content

1. Understand principles for planning and designing group circuit training sessions	

1.1 Outline different types and formats of group circuit training sessions	**Types:**
	• Timed/interval circuit:
	  ○ most common
	  ○ start and finish of each exercise station controlled by the instructor
	  ○ time on station, usually between 20 and 45 seconds.
	• Repetition circuit:
	  ○ at each station, the participants select the number of reps they wish to do from guidelines provided by instructor (verbal/cards).
	• Bodyweight:
	  ○ circuits performed without equipment
	  ○ intensity can be altered by adaptations/alternatives which alter levers, etc.
	• Command:
	  ○ number of reps at each station controlled by the instructor.
	• Sport-specific:
	  ○ types of exercises are selected appropriate/functional to the sport.

	Formats:
	• Satellite (circle/square):
	  ○ stations can be aerobic, muscular strength and endurance, or a combination of both
	  ○ participants start at any station and move around the exercises in a clockwise direction.
	• Bow tie circuits:
	  ○ stations are usually aerobic/bodyweight exercises which work the major muscle groups
	  ○ participants start at any station and move around the exercises in a figure of eight.
	• Strength circuits:
	  ○ resistance is generally selected to achieve overload within 12-15 reps.
	• Shuttle circuits:
	  ○ a shuttle run is included between each exercise
	  ○ concentric circle circuits:
	  – commonly two concentric circles: one for upper body exercises and one for lower body exercises.
	• Benefits of circuit training and components of fitness that can be trained using different types and formats:
	  ○ versatile, accommodate different fitness levels, fun, social, engaging and motivating
	  ○ cardiovascular fitness
	  ○ muscular fitness
	  ○ flexibility
	  ○ functional ability
	  ○ motor skills.

1.2 Describe how training variables can be modified to accommodate different objectives	• Impact of the following on planning and delivery:
	  ○ different participant demographics
	  ○ different participant objectives:
	  – improve fitness (different components)
	  – improve motivation
	  – improve skills and techniques
	  – improve health
	  – fun and enjoyment
	  ○ effects of different training approaches – linking to anatomical and physiological systems

	○ variables and their effects on above objectives: – frequency, intensity, time, type/specificity, volume, progression (FITT-VP) – circuit design (see principles) – total session time – timing of each component, e.g. warm-up, main workout, cooldown – work and rest ratio – active recovery/rest – transition time between exercises/stations – number of exercises/stations – number of circuits – type of exercises – exercise order – speed of movement – range of movement – intensity – variety – progressions/regressions/adaptations/alternatives – muscle balance/targeting specific areas/objectives – inclusion of cardiovascular and resistance stations – social element/teaming-up/buddying ○ timetabling: timing of sessions/frequency of sessions.
1.3 Identify a range of equipment used in group circuit training sessions and its uses	• Cardiovascular equipment (fixed and portable), to include: ○ treadmill ○ rowing machine ○ step/stepper ○ cross-trainer ○ elliptical trainer ○ upright/recumbent bike ○ skipping rope ○ benches ○ steps ○ boxing gloves.

	• Resistance/other equipment (fixed and portable), to include:
	  ○ dumbbells
	  ○ barbells/weighted bars
	  ○ resistance machines
	  ○ stability balls
	  ○ resistance bands
	  ○ kettlebells (if qualified)
	  ○ mats
	  ○ medicine balls
	  ○ bench
	  ○ Bosu ® ball.
	• Components of fitness trained.
	• Range of exercises using different equipment.
	• Relevant safety and induction considerations when using different equipment.
	• Consideration of appropriateness of equipment to individual needs.

1.4 Describe the principles of group behaviour management during group circuit training sessions	• How the number of participants will affect the space and equipment required and the most effective circuit designs to manage larger groups. • Effective space management to avoid collision. • Effective spacing of equipment to ensure safety. • Assertive communication skills to manage and direct group. • Appropriate alternatives that contain similar movement patterns. • Changing teaching position to improve observation of the group. • Changing the orientation of the group. • Effective communication (visual and verbal).

1.5 Outline methods of inducting circuit exercises/stations to participants	• Induction essential for new participants, the introduction of new exercises and introduction of new equipment.
	• Use of IDEA teaching sequence to induct new exercises with consideration of learning styles – visual, auditory and kinaesthetic (VAK) and experience of participants:
	  ○ introduce exercise – name the exercise and areas worked
	  ○ demonstrate exercise – accurate demonstration and keeping the group moving
	  ○ explain exercise – key alignment and instructional points
	  ○ activity – let group practice

	• consideration of how and when exercises inducted and the effect on exercise:
	  ○ induction of exercises (rehearsal of skills through warm-up).
	  ○ induction of exercises at the beginning of the circuit.

1.6 Outline essential considerations when planning and delivering group circuit training sessions	• Plan a class type and structure based on client goals and objectives for effectiveness and enjoyment of participants. • Feel confident and relaxed about the session ahead. • Professionalism. • SMART goals. • How to monitor participants' performance and exercise intensity. • Relevant teaching and instructional skills and their application. • Have adequate and relevant equipment for the session. • Risk assessment of the environment and equipment. • Pre-screening considerations. • Preparing equipment and environment.

1.7 Outline considerations for selecting music for each component of group circuit training sessions	• Selecting music:
	  ○ appropriate beats and tempos, e.g. if too fast it may encourage participants to compromise technique
	  ○ for circuit style and session objective, e.g. cardio or resistance, focus or a combination
	  ○ for group/participant preferences and ability, e.g. height, lever length, fitness, skill level, coordination, balance, flexibility, etc.
	  ○ for component, i.e. energetic music for higher intensity main phase, softer more relaxing music for cooldown, etc.
	• Music speed (tempo) measured in beats per minute (bpm):
	  ○ purpose:
	  – consider if the aim is to work to the beat or use music as background
	  ○ warm-up (mobility, pulse raiser, stretch; 120-135 bpm)
	  ○ main component:
	  – aerobic movements (depending on type and range of motion), e.g. jumping jacks, burpees, etc. (125-150 bpm)
	  – muscular strength and endurance exercises (120-135 bpm)
	  ○ cooldown (maintenance and developmental).
	• How music can regulate the intensity:

	○ music selection can affect the atmosphere of the session, e.g. motivation of participants ○ the effect of different speeds of music on safety and effectiveness of movement/technique pace of exercise. • Pre-recorded music that sets the work and rest ratio, e.g. high intensity interval training or HITT sessions. • Music license requirements.

2. Be able to plan a group circuit training session	
2.1 Plan a safe and effective group circuit training session for a range of participants	• Outline session objectives with consideration of the information gathered (screening). • Targeted level, e.g. beginners. • SMART targets. • Review objectives to monitor the progress of participants. • Session structure: ○ warm-up: mobility, pulse raising and muscle lengthening ○ main section: components of fitness, appropriate exercises included, required equipment, circuit layout, intensities, alternatives, etc. ○ cooldown: using appropriate stretches, including maintenance and developmental. • Exercises and fitness components: ○ cardiovascular exercise ○ bodyweight exercise ○ small equipment, e.g. use of mats for core/abdominal exercise ○ functional exercise, i.e. exercises that address the movement patterns/muscle actions/components of fitness required for activities of daily living ○ flexibility and range of motion exercise (static stretching and mobilisation of joints). • Select appropriate music tempo for each component of the class (as appropriate). • Risk assessment records for equipment, environment and participants.

2.2 Provide suitable adaptations, including progressions and regressions, where appropriate	• See variables within 1.2. • Modifications according to ability and skill of group and individuals. • Less intense version – lower resistance, shorter levers, less impact, etc. • More intense version of exercise – heavier resistance, longer levers, higher impact, etc. • Different exercise if needed – aim to work same muscle groups or fitness component. • Adapt joint actions and exercise position, as needed.

2.3 Record programme plans in an appropriate format	• Records to:
	  ○ be clear and structured
	  ○ use an appropriate format.
	• To maintain a record of content:
	  ○ for monitoring purposes, e.g. progression
	  ○ in the event of litigation.
	• Storage to align with GDPR and data protection guidelines.

3. Be able to prepare to instruct a group circuit training session	

3.1 Prepare self, the environment and equipment, as appropriate, for the session	• Self:
	  ○ professional demeanour, e.g. clothing, uniform and personal attributes, positive first impressions
	  ○ ambassador for the sector, leading by example and displaying positive health behaviours.
	• Environment and equipment:
	  ○ written risk assessment record, to outline:
	  – potential hazards
	  – who may be harmed
	  – likelihood and severity of risk
	  – control measures
	  ○ if risks can't be controlled, personally speak to the responsible individual within the facility
	  ○ ensure cleanliness of the environment and equipment:
	  – if required, clean the area using appropriate products prior to the session (or work with colleagues to support with cleaning)
	  ○ appropriate circuit layout for the number of participants and type of circuit.

3.2 Verbally screen participants and use information to provide guidance	• Welcome participants. • Check readiness to participate. • Check for any changes since completion of a written PAR-Q+. • Reasons for deferral or referral – contraindications or needs outside of scope. • Outline aims and objectives of session. • Opportunities for questions. • Health and safety advice, e.g. drinking water, lifting and moving equipment, etc. • Use of appropriate resistance for equipment (where appropriate).

4. Be able to deliver a group circuit training session	
4.1 Engage participants from the outset using effective communication to help participants feel welcome and at ease	• Effective communication skills and group management. • Polite and professional. • Demonstrating active listening skills. • Giving clear and concise explanations for equipment and exercises (avoiding jargon).

4.2 Deliver a safe and effective warm-up for a group circuit training session	• Warm-up – overall body approach, including mobility, warming and appropriate muscle lengthening and range of motion exercises to achieve objectives.
	• Establish and maintain appropriate exercise intensity.
	• Induct exercises and stations appropriately.
	• Use music effectively (where appropriate).
	• Manage time effectively.
	• Consideration of:
	  ○ participant fitness levels and appropriate modifications and teaching skills
	  ○ intensity of workout

	○ temperature/environmental conditions.
4.3 Deliver a safe and effective main workout for group circuit training session	• Main section – overall body approach, including all muscle groups, and aim for muscle balance to achieve objectives. • Use of appropriate exercises to achieve goals and improve components of fitness: ○ cardiovascular and muscular exercises ○ bodyweight exercise ○ small equipment, e.g. use of mats for core/abdominal exercises ○ functional exercise, e.g. exercises that address the movement patterns/muscle actions/components of fitness required for activities of daily living. • Make use of suitable equipment (appropriate to the class format and session). • Establish and maintain appropriate exercise intensity. • Use music effectively (where appropriate). • Manage time effectively. • Consideration of: ○ participant fitness levels and appropriate modifications and teaching skills ○ intensity of workout ○ temperature/environmental conditions.
4.4 Deliver a safe and effective cooldown and ending for a group circuit training session	• Cooldown – to include lowering intensity, maintenance and developmental stretches, and achieve objectives. • Flexibility and range of motion exercise (static stretching and mobilisation of joints). • Use music effectively (where appropriate). • Consideration of: ○ participant fitness levels and appropriate modifications and teaching skills ○ intensity of workout ○ temperature/environmental conditions. • Provide participants with feedback to end the session: ○ strengths ○ areas for development ○ praise/positive reinforcement ○ performance during the session ○ future needs/goals.

	• Give the participants the opportunity to:
	  ○ reflect on the session
	  ○ ask questions
	  ○ provide feedback
	  ○ identify further needs.
	• Leave the environment in a condition acceptable for future use.
	  ○ replacing equipment to its correct storage space
	  ○ wiping down equipment
	  ○ reporting any maintenance issues
	  ○ leaving the area safe, clean, tidy and ready for other users.

4.5 Demonstrate and explain safe and effective exercise technique for all exercises, using motivational and communication styles appropriate to the participants and the exercise format	• Use explanations and demonstrations that are technically correct, safe and appropriate to the individual participant's needs and experience. • Consider different learning styles – visual, auditory and kinaesthetic. • Use motivational and communication styles appropriate to the participants and the exercise format. • Effective participant communication involves adapting communication style, attitude and response to suit participants and their specific needs. • Skills include professionalism, adherence to the organisation's code of conduct (specific greetings/procedures), good manners, appropriate language and friendly attitude. • Behaviour may need to be adapted to different types of participants.
4.6 Use voice projection, volume and pitch relative to the environment and music used (where used): • with or without a microphone	• Audible. • Varied intonation – use vocal contrast and voice tone to increase or decrease intensity or provide focus or emphasis (as appropriate). • Motivational. • Appropriate to component.
4.7 Use appropriate teaching positions and instructional methods to **observe and monitor** participants and respond to their needs	• Ensure that they can see the participants and that participants can see them. • Changing teaching position. • Communicate with consideration of different learning styles – visual, auditory and kinaesthetic.

	• Observe, monitor and engage with clients to ensure safety and effectiveness:
	  ○ observe movement and exercise technique to ensure safe and effective alignment, execution and use of equipment
	  ○ provide general and specific instruction points, feedback, encouragement and reinforcement in a friendly, professional manner
	  ○ reinforce teaching points
	  ○ correct and reinforce technique for safety and effectiveness
	  ○ ask questions to check participants' understanding, as appropriate
	  ○ verbal and visual communication to improve technique
	  ○ mirroring (as appropriate).
	• Monitor intensity using appropriate methods (benefits and limitations):
	  ○ talk test
	  ○ rating of perceived exertion (RPE)
	  ○ heart rate monitoring and target heart rate zones.

4.8 Provide alternatives, modifications and progressions of exercises appropriate to individual needs	• Offer adaptations and alternatives to meet individual needs and improve performance (progression, regression, corrective strategies and alternative exercises as required).
	• Use of FITT-VP principles.
	• Layering of information.
	• Modification according to individual needs, such as:
	  ○ speed
	  ○ levers
	  ○ exercise position
	  ○ repetitions
	  ○ resistance
	  ○ range of motion
	  ○ alternative equipment.

5. Be able to review the session and reflect on practice	

5.1 Evaluate the effectiveness of the session to ensure it is engaging, varied and meets participants' needs/goals	• Conduct regular reviews to check the effectiveness of the programme to meet participant needs, progress towards goals and any improvements that can be made.
	• To include (where appropriate) the use of smartphones, tablets, laptops and other digital devices to film themselves and use self-review to improve practice.
	• Reviews to include:
	  ○ gathering feedback from clients in verbal or written formats
	  ○ accepting feedback objectively
	  ○ offering credible advice and guidance appropriate to own level of expertise to promote positive healthy lifestyle choices.
	• Appraise in relation to the session, environment, participant, group needs:
	  ○ the appropriateness of exercises
	  ○ the effectiveness of session structure, content and use of any equipment
	  ○ the effectiveness of motivational skills and relationship with the participants
	  ○ the instruction and communication style
	  ○ the safety and effectiveness of programme and exercises
	  ○ things that went well
	  ○ things to improve
	  ○ own performance
	  ○ participants' performance.
	• Propose changes/adaptations to the session based on the appraisal:
	  ○ signpost participants to other aspects of the facility if they show an interest in other areas/activities.

5.2 Outline how to use information to improve personal practice	• The value of reflective practice.
	  ○ improving own performance and aiding personal development
	  ○ improving participants' performance and supporting retention
	  ○ meeting participants' expectations
	  ○ ensuring programmes are safe and effective

	○ identifying specific improvements to instructional skills and communication ○ identifying ways to improve session content for meeting participant needs, to include: – adaptation of plans, equipment and facilities to accommodate the range of particular needs – selection of exercises that are safe, effective and reflect current guidelines for good practice – provision of alternatives – providing advice to participant(s) regarding safe and effective alignment of exercise positions. • How to find and use information and the benefit of conducting evaluation(s): ○ information gathering sources (questionnaires, comment slips, verbal) ○ sources of information (self, participants, supervisors, peers) ○ discussion of information with relevant personnel (studio coordinator/line manager).

Plan, deliver and evaluate group indoor cycling (Y/650/7422)

Unit aim

To develop the knowledge and skills required to safely and effectively plan, deliver and review group indoor cycling sessions, within scope of practice.

Learners will:

- instruct safe set-up of bikes
- deliver session, using suitable group cycling profiles and techniques, including the appropriate use of music
- manage group behaviour
- demonstrate effective communication and instructional skills
- engage and fully support a range of participants.

Content

1. Understand principles for planning and designing group indoor cycling sessions	

1.1 Outline the benefits, advantages and disadvantages of group indoor cycling sessions	**Benefits and advantages**
	• Fitness benefits – cardiovascular and lower body endurance focus.
	• Health benefits:
	  ○ reduce risk of major illnesses, such as heart disease, stroke and type 2 diabetes
	  ○ increase self-esteem, mood, sleep quality and energy levels
	  ○ reduce risk of stress, depression
	  ○ assist weight management.
	• Social benefits and motivation in group environment and riding side by side.
	• Requires little coordination and so caters for all levels of skills and abilities.
	• Allows individuals of different fitness levels to participate in the same class.
	• Non-impact and so permits individuals with lower limb arthritis or joint conditions to still achieve high levels of cardiovascular fitness.

	Muscles trained
	• During the pedal stroke:
	  ○ quadriceps, hamstrings, gastrocnemius, soleus, gluteals.
	• For stabilisation whilst seated:
	  ○ rectus abdominis, obliques
	  ○ latissimus dorsi, erector spinae
	  ○ core stability.
	• Additional muscles used for stabilisation whilst standing:
	  ○ biceps, triceps
	  ○ deltoids.
	Disadvantages
	• May be daunting for some, e.g. speed work and riding next to others (more experienced).
	• Bike set-up needs instruction.
	• Saddle soreness.
	NB: The GLH would ideally include participation in at least one group indoor cycling session.

1.2 Identify riding techniques and training profiles used in group indoor cycling sessions	• Hand positions:
	  ○ narrow grip – generally used for lower resistance levels during:
	  – warm-up/cooldown
	  – seated 'flat'
	  – seated sprinting
	  ○ wide grip – allows a more open chest and is therefore suitable for moderate resistance levels during:
	  – seated 'climbing'
	  – 'running' (both 'hill' and 'flat')
	  – 'jumping' (both 'hill' and 'flat')
	  – seated sprinting
	  ○ high and wide grip – helps ensure stability and is therefore used when out of the saddle with a high resistance:
	  – standing 'climb'
	  – 'hill' sprinting only.
	• Riding techniques and profiles – seated and standing:
	  ○ seated 'flat riding':

	– forms basis of class by helping to develop pedal stroke technique and stamina – can be used for a warm-up/cooldown and recovery in between profiles – low to medium resistance – cadence of 80-110 rpm – narrow/wide grip o seated ‘climbing’: – participants should ensure a strong and fluid riding style whilst maintaining a strong and stable upper body – medium to high resistance – cadence of 60-80 rpm – wide grip o seated sprints: – often choreographed specifically to music, e.g. during the chorus – medium resistance – cadence of 100 rpm + (pedal as fast as possible without losing form) – >30secs – narrow or wide grip – for safety, to come out of a sprint, the brake should be used o standing ‘flat’ (‘running’): – aim is to pedal at the same speed as in a seated ‘flat’ whilst pushing at a slightly higher resistance – medium resistance – cadence of 80-120 rpm – provides break from the seated position – wide grip. o standing (‘climbing’): – involves riders being out of the saddle and pushing against a high resistance – cadence of 60-80 rpm – high and wide grip

	– the use of toe straps will allow and encourage riders to pull-up as well as push down on the pedals ○ standing sprints (‘running’ sprints): – see seated sprints above. However, by standing, the rider is able to sprint against a slightly higher resistance – wide grip – as with seated sprints, riders should be instructed to use the brake when slowing ○ alternating between seated and standing (‘jumping’): – fast repetitive interval training, requiring the rider to change between seated and standing positions at regular intervals – can be done either as ‘jumping flat’, with a medium resistance and cadence of 80-100 rpm, or ‘jumping hills’, with a slightly greater resistance and a cadence of 60-80 rpm. In each case a wide grip should be used – although it is important to ensure a smooth transition between intervals, making their occurrence irregular can bring additional entertainment and variety to the class. **NB**: This list is not exhaustive. There are variations of many exercises that can also be included.
1.3 Explain the set-up and adjustments needed to ensure safe group indoor cycling	• Components of an indoor cycle: ○ handlebar ○ seat ○ pedals, toe straps/cages ○ brakes ○ chain and chain guard. • Maintenance checks: ○ smooth action (bearings) ○ non-frayed cables ○ free from rust ○ chain tensioned correctly. • Adjustments – off bike and their importance: ○ handlebars: – same height or slightly higher than the saddle

	– positioned individually to aid comfort and avoid strain on the back ○ saddle: – height set to ensure a slight bend in the knee during each revolution. This is generally achieved by adjusting the saddle height so that it is approximately in-line with the participant's hip when they stand next to their bike, although should be checked when the rider sits on the bike ○ horizontal adjustment (fore/aft): – kneecap (patella) should be directly over the axle of the pedal when the cranks are in a horizontal position with feet on the pedals. This position will minimise stress on the knee and enable the rider to reach the handlebars comfortably with elbows which are slightly bent ○ pedal strap adjustment. • Fixed wheel cycling considerations: ○ fixed wheel cycle – there is a direct drive train that spins the wheels of the bike ○ feet must always be securely fixed to the pedals, i.e. use of toe straps/cages ○ freewheeling is not an option ○ always use the brake to slow down out of a sprint ○ tie shoelaces to ensure they cannot become trapped in the chain ○ use of toe strap fittings. • Importance of regular hydration: ○ sweating causes fluid loss, which if left unchecked, may lead to: – dehydration, heat cramps, heat exhaustion or heat stroke – a drop in both endurance levels – mental fatigue. • Suitable clothing and footwear: ○ to allow the use of toe straps (so that feet are securely attached to the pedals) ○ to minimise risk of friction burns or blisters ○ to prevent 'catching' in mechanics (better to wear shorts/tighter pants rather than baggy tracksuits). • Correct cadence throughout the session:

	○ higher cadences minimise stresses on joints ○ ensuring a minimum cadence of 60 rpm will prevent too great a resistance being selected ○ effectiveness of session ○ the intensity of each section of the class is closely related to intensity at which it is performed.
1.4 Describe how training variables can be modified to accommodate different objectives	• Participant demographics may have different objectives and goals, such as: ○ improve fitness ○ improve motivation, e.g. exercising with others, rather than alone ○ improve skills and techniques ○ improve health (physical, mental, etc.) ○ social benefits ○ fun and enjoyment. • Consideration of diversity of participant objectives in group exercise. • Effects of different training approaches – linking to anatomical and physiological systems. • Variables and their effects on the above objectives: ○ use American College of Sports Medicine (ACSM) evidence-based guidelines for fitness components ○ use Chief Medical Officer (CMO) evidence-based guidelines for health ○ frequency, intensity, time, type/specificity, volume, progression (FITT-VP) ○ progressive overload, reversibility, adaptability, individuality, recovery time ○ total session time. • Methods of varying intensity: ○ resistance ○ cadence/tempo of music ○ riding technique. • Training profiles and effects/purpose **–** the contours of the intended 'journey': ○ flat sections ○ 'false flats' (low, but very gentle uphill sections) ○ undulating and hilly

	○ gentle hills – up and down ○ steep hills – up and down. • Visualisation techniques – mental imagery to describe the terrain and surroundings: ○ demanding 'hill' sections ○ locations ○ events ○ progressions/regressions/adaptations/alternatives ○ muscle balance/targeting specific areas/objectives ○ social element/teaming-up/buddying. • Timetabling: timing of sessions/frequency of sessions.
1.5 Outline essential considerations when planning and delivering group indoor cycling sessions	• Plan a class type and structure based on participant goals and objectives for both effectiveness and enjoyment: ○ music track/title suitable for profile and component ○ riding techniques ○ duration ○ safety checks ○ teaching points and set-up, e.g. hand position ○ visualisations. • Importance of planning: ○ feel confident and relaxed about the session ahead ○ professionalism ○ consider how to monitor participants' performance and exercise intensity. • Planning to include: ○ preparation of environment, equipment and resources needed to deliver the session ○ risk assessment of the participants, environment and equipment ○ pre-screening considerations ○ relevant teaching and instructional skills and their application throughout the session: – demonstration – voice – tone, volume, language and instructions – teaching position – observation and correction – alternatives and teaching points.

1.6 Describe the principles of group behaviour management during group indoor cycling sessions	• How the number of participants will affect space available, e.g. positioning of bikes. • Effective space management. • Appropriate alternatives. • Changing teaching position to improve observation of the group and support participants. • Effective cueing and communication (visual and verbal). • Effective riding profiles appropriate to skill level of group. • Where appropriate, organise own work duties alongside colleagues and participants to ensure that activity areas are ready for use and that all relevant equipment is set-up, dismantled and stored safely.

1.7 Outline considerations for selecting music for each component of group indoor cycling sessions	• Session component.
	• Group/participant preferences and ability.
	• Cadence.
	• Music speed (measured in beats per minute [bpm]):
	  ○ depending on participants – height, lever length, fitness, skill level, coordination, balance, flexibility, etc.
	  ○ beats and tempos, e.g. too fast may encourage participants to compromise technique, lose control.
	• How music may be used to regulate the intensity of different profiles/sections of the session:
	  ○ matching bpm (tempo) to rpm
	  ○ using choruses for sprints
	  ○ aggressive vocal styles to encourage effort/motivation
	  ○ some lyrics may aid visualisation
	  ○ changes in volume
	  ○ genres.
	• Effects of music on intensity and motivation:
	  ○ motivation, including the risk of over motivation and demotivation
	  ○ atmosphere and effects of music for specific components, e.g. warm-up – gradual heart rate raising, relaxation and cooldown
	  ○ different speeds can impact safety and effectiveness of movement/technique
	  ○ sets pace of exercise – may not be appropriate for all participants.
	• Consideration of music sources and legalities.

	• Using music to assist planning:
	  ○ the duration of a music track will determine the length of a specific activity, including session components
	  ○ profile and technique tracks, e.g. uphill climb
	  ○ to establish pace of exercise, e.g. fast beat for high intensity exercise, slower beat for cooldowns/stretch
	  ○ prompting participants, e.g. when the beat kicks in, cycle sprints.

2. Be able to break down and use music	
2.1 Select appropriate music for use in a group indoor cycling session	• For all components of the session. • Range of tracks to be appropriate to riding techniques and profiles and establish appropriate cadence. • See 1.7.

2.2 Breakdown music to plan a group indoor cycling session	• Break down music into components.
	• Beat/tempo – slow beat or fast beat (bpm):
	  ○ most popular music is 4/4 timing
	  ○ some music has irregular beats or patterns, more complex to work with, e.g. some Latin and ballroom tracks (waltz 3/4 timing).
	• Phrases – (eight beats = one phrase).
	• Blocks – one block – 8888 = four phrases = 32 beats.
	• Verse and chorus and working to music structure/components:
	  ○ introduction
	  ○ verse
	  ○ chorus
	  ○ instrumental.

3. Be able to plan a group indoor cycling session	

3.1 Plan a safe and effective group indoor cycling session for a range of participants	• Appropriate for a range of clients within scope of practice, using appropriate equipment and methods:
	  ○ outline session objectives
	  ○ targeted level, e.g. beginners, mixed ability
	  ○ participants' needs within scope of practice
	  ○ how participant numbers and the exercise environment impact upon session design, safety and effectiveness.
	• Appropriate session content for the environment and appropriate music:
	  ○ warm-up (mobility, pulse raising and muscle lengthening)
	  ○ main section (cardiovascular focus – riding techniques and profiles)
	  ○ cooldown (using appropriate stretches, including maintenance and developmental)
	  ○ correct timings for all components
	  ○ select appropriate music tempo for each component of the class (as appropriate).
	• Fitness components included:
	  ○ cardiovascular fitness and lower body endurance and strength
	  ○ flexibility and range of motion exercise (static stretching and mobilisation of joints).
	• How to set and adapt meaningful goals linked to group needs, wants and motivators:
	  ○ SMART targets and goals
	  ○ review objectives to monitor progress of participants
	  ○ risk assessment records for equipment, environment and participants.
	See 1 for all information to consider when planning.

3.2. Provide suitable adaptations, including progressions and regressions, where appropriate	• Frequency, intensity, time, and type of exercise. • Adaptations for all session components. • Adaptations to riding techniques and profiles. • Adaptations depend on participant(s) ability, skill, and specific needs. • Different learning styles, goals, needs, likes/dislikes, etc. and how these should be reflected in planning. • See training variables within section 1.4.

3.3. Record programme plans in an appropriate format	• Records to:
	  ○ be clear and structured
	  ○ use an appropriate format.
	• To maintain a record of content:
	  ○ for monitoring purposes, e.g. progression
	  ○ in the event of litigation.
	• Storage to align with GDPR and data protection guidelines.

4. Be able to prepare to instruct a group indoor cycling session	

4.1 Prepare self, the environment and equipment as appropriate to the session	• Self:
	  ○ professional demeanour, e.g. uniform and personal attributes, positive first impressions
	  ○ ambassador for the sector, leading by example and displaying positive health behaviours
	  ○ music prepared
	  ○ bikes maintained.
	• Environment and equipment risk assessment:
	  ○ written risk assessment record (and dynamic), to outline:
	  – potential hazards – individuals, equipment, environment
	  – who may be harmed
	  – likelihood and severity of risk
	  – control measures to ensure safety and minimise risk
	  – if risks can't be controlled personally, speak to the responsible individual within the facility
	  ○ ensure cleanliness of the environment and equipment:
	  – if required, clean the area using appropriate products prior to the session (or work with colleagues to support with cleaning)
	  ○ appropriate layout of the studio/area with space between bikes
	  ○ advising participants of the space between them and others
	  ○ storing participants' belongings in a safe place
	  ○ use of any equipment with reference to manufacturer instructions (as appropriate)

	○ instruct participants in the safe set-up of their own bikes ○ explain key health and safety aspects of the group indoor cycling session.
4.2 Verbally screen participants and use information to provide guidance	• Welcome participants. • Verbal health screen to check readiness to participate: ○ check for any changes since completion of a written PAR-Q+ ○ risk stratification and checking suitability of programme, based on client wellbeing ○ awareness of any adaptations to be made ○ consideration if paper-based health check may not have been completed ○ reasons for temporary deferral of exercise, or referral. • Outline aims and objectives of session. • Opportunities for questions. • Health and safety advice, e.g. drinking water, etc: ○ emergency exit points ○ fire alarm procedure ○ assembly points ○ security procedures. • Confirm or revise plans with participants, as appropriate. • Adapt the planned session, based upon any revised information.

5. Be able to deliver a group indoor cycling session	
5.1 Engage participants from the outset, using effective communication to help participants feel welcome and at ease	• Effective communication skills and group management. • Polite and professional. • Demonstrating active listening skills. • Giving clear and concise explanations for equipment and exercises (avoiding jargon). • The purpose/aims of the session. • Relevant health and safety advice. • Inspire participants, injecting personality (showpersonship) to every session. • Being available to participants immediately before and after the allotted session time.

5.2 Deliver a safe and effective warm-up for a group indoor cycling session	• Warm-up – overall body approach, including mobility, warming and appropriate muscle lengthening and range of motion exercise to achieve objectives.
	• Establish and maintain appropriate exercise intensity.
	• Use appropriate pace and speed of exercises to ensure safety and effectiveness.
	• Use music effectively.
	• Manage time effectively.
	• Consideration of:
	  ○ participant fitness levels and appropriate modifications and teaching skills
	  ○ intensity – riding techniques and profiles
	  ○ temperature/environmental conditions.

5.3 Deliver a safe and effective cardiovascular component for a group indoor cycling session	• Build-up, maintain and cooldown to achieve target training level.
	• Use of appropriate exercises:
	  ○ appropriate profiles and riding techniques.
	• Establish and maintain appropriate exercise intensity.
	• Use appropriate pace and speed of exercises to ensure safety and effectiveness.
	• Effective use of:
	  ○ music
	  ○ time.
	• Consideration of:
	  ○ participant fitness levels and appropriate modifications and teaching skills
	  ○ intensity of workout
	  ○ temperature/environmental conditions.

5.4 Deliver a safe and effective cooldown and ending for a group indoor cycling session	• Cooldown – to include lowering intensity and stretches to achieve objectives.
	• Flexibility and range of motion exercise (static maintenance and developmental stretching and mobilisation of joints).
	• Use music effectively.
	• Consideration of:
	  ○ participant fitness levels and appropriate modifications and teaching skills
	  ○ intensity of workout

	○ temperature/environmental conditions. • Provide participants with feedback to end session: ○ strengths ○ areas for development ○ praise/positive reinforcement ○ performance during the session ○ future needs/goals. • Give the participants the opportunity to: ○ reflect on the session ○ ask questions ○ provide feedback ○ identify further needs. • Leave the environment in a condition acceptable for future use: ○ replacing equipment to its correct storage space ○ wiping down equipment ○ reporting any maintenance issues ○ leaving the area safe, clean, tidy and ready for other users.
5.5 Demonstrate and explain safe and effective exercise technique for all exercises, using motivational and communication styles appropriate to the participants and the exercise format	• Use explanations and demonstrations that are technically correct, safe and appropriate to the individual participant's needs and experience: ○ all components of session ○ riding techniques and profiles ○ bodyweight exercise and small equipment (if used) ○ functional exercise, e.g. exercises that address the movement patterns/muscle actions/components of fitness required for activities of daily living ○ flexibility and range of motion exercise (static stretching and mobilisation of joints). • IDEA teaching sequence (as appropriate): ○ introduce and name exercise ○ demonstrate – show ○ explanation – tell ○ activity – practice. • Consider different learning styles – visual, auditory and kinaesthetic.

	• Use effective motivational and communication styles appropriate to the participants and the exercise format.
	• Adapt communication style, attitude and response to suit participants and their specific needs.
	• Skills include professionalism, adherence to the organisation's code of conduct (specific greetings/procedures), good manners, appropriate language and friendly attitude.
	• Behaviour may need to be adapted to different types of participants.
	• Check participants' understanding at regular intervals, to include:
	  ○ effective communication methods
	  ○ asking open-ended questions that encourage the participants to speak at length.
	  ○ using active listening to create rapport
	  ○ ensuring the participants understand the instructions and guidance offered.
	  ○ ensuring the instructor understands the information given by the participant.

5.6 Use voice projection, volume and pitch relative to the environment and music used: • with or without a microphone	• Audible. • Varied intonation – use vocal contrast and voice tone to increase or decrease intensity or provide focus or emphasis (as appropriate). • Motivational. • Appropriate to component.

5.7 Use appropriate teaching positions and instructional methods to **observe and monitor** participants and respond to their needs	• Monitoring both safety and intensity of exercise.
	• Changing teaching position to ensure that they can see the participants and the participants can see them.
	• Communicate and instruct with consideration of:
	  ○ different learning styles – visual, auditory, and kinaesthetic
	  ○ use of questions to check participants' understanding, as appropriate
	  ○ verbal and visual communication to improve technique
	  ○ mirroring (as appropriate)
	  ○ building rapport.
	• Observe and engage with clients to:
	  ○ improve performance

	○ monitor movement and exercise technique ○ ensure safe and effective alignment ○ ensure correct use of equipment ○ provide general and specific instruction points ○ provide feedback, encouragement and reinforcement in a friendly, professional manner ○ reinforce teaching points. ○ correct and reinforce technique for safety and effectiveness ○ approaching clients in a friendly, non-threatening manner ○ when to proactively engage with clients and when not to. • Establish and maintain appropriate exercise intensity for each component. • Monitor intensity using appropriate methods (benefits and limitations): ○ talk test ○ Rating of Perceived Exertion (RPE) ○ heart rate monitoring and target heart rate zones. • Develop participant coordination by building exercise to music patterns logically.
5.8 Provide alternatives, modifications and progressions of exercises appropriate to individual needs	• Layering of information. • Using principles of fitness and FITT to accommodate different abilities and individual needs that present in a mixed ability group. • Modification and adaptation to meet individual needs can include changes to: ○ speed of music ○ exercise position ○ repetitions, resistance, rest, range of motion ○ riding techniques and profiles.
5.9 Demonstrate effective cueing to work with the music	• Visual and verbal cues. • Cues in sufficient notice to support safe transitions.

6. Be able to review the session and reflect on practice	

6.1 Evaluate the effectiveness of the session to ensure it is engaging, varied and meets participants' needs/goals	• Conduct regular reviews to check the effectiveness of the programme to meet participant needs, progress towards goals and any improvements that can be made.
	• To include (where appropriate) the use of smartphones, tablets, laptops and other digital devices to film themselves and use self-review to improve practice.
	• Reviews to include:
	  ○ gathering feedback from clients in verbal or written formats
	  ○ accepting feedback objectively
	  ○ offering credible advice and guidance appropriate to own level of expertise to promote positive healthy lifestyle choices.
	• Appraise in relation to the session, environment, participant group needs:
	  ○ the appropriateness of exercises
	  ○ the effectiveness of session structure, content and use of any equipment
	  ○ the effectiveness of motivational skills and relationship with the participants
	  ○ instruction and communication style
	  ○ the safety and effectiveness of programme and exercises
	  ○ things that went well
	  ○ things to improve
	  ○ own performance
	  ○ participants' performance.
	• Propose changes/adaptations to the session based on the appraisal.
	• Signpost participants to other aspects of the facility if they show an interest in other areas/activities.

6.2 Outline how to use information to improve personal practice	• The value of reflective practice:
	  ○ improving own performance and aiding personal development
	  ○ improving participants' performance and supporting retention
	  ○ meeting participants' expectations
	  ○ ensuring programmes are safe and effective

	○ identifying specific improvements to instructional skills and communication. • Identifying ways to improve session content for meeting participant needs, to include: ○ adaptation of plans, equipment and facilities to accommodate the range of particular needs ○ selection of exercises that are safe, effective and reflect current guidelines for good practice ○ provision of alternatives ○ providing advice to participant(s) regarding safe and effective alignment of exercise positions. • How to find and use information and the benefit of conducting evaluation(s): ○ information gathering sources (questionnaires, comment slips, verbal) ○ sources of information (self, participants, supervisors, peers) ○ discussion of information with relevant personnel (studio coordinator/line manager).

Group E: Personal Training

Nutrition for physical activity and exercise (F/650/6219)

Unit aim

The aim of this unit is to provide learners with the knowledge and understanding of the key principles of nutrition and healthy eating and how these can be applied to support health and wellbeing.

Learners will develop skills to apply official and evidence-based nutritional and healthy eating guidance to support individuals participating in physical activity and exercise within scope of practice.

Content

1. Understand the principles of nutrition for health and wellbeing	
1.1 Define nutritional terminology	• diet • healthy eating • nutrition • healthy, balanced diet • macronutrients • micronutrients • UK dietary reference values (DRV) • recommended daily allowance (RDA) • recommended daily intake (RDI) • glycaemic index (GI).

1.2 State current government guidelines for healthy eating to meet individual needs	• Eatwell guide (evidence-based) recommendations.
	• How dietary needs can differ by gender, age and physical activity level.
	• Principles of nutrition in relation to the Eatwell guide.
	• How Eatwell guide information and evidence-based recommendations can be used to support different client goals:
	  ○ fat loss:
	  – creating a calorie deficit
	  – important nutrients to elicit greater fat usage and support fat loss

	– greater level of protein intake to prevent muscle atrophy – higher levels of physical activity, in particular resistance training and high intensity cardiovascular activity ○ weight-loss: – creating a calorie deficit – no adjusting of macronutrient contribution as long as a calorie deficit exists ○ hypertrophy (application exceeds scope of practice) ○ sports performance (application exceeds scope of practice). • The importance of regular eating patterns to support a healthy, balanced diet.
1.3 Explain the role of the macronutrients and micronutrients in health and wellbeing	• Function and food sources of main nutrients to meet nutritional requirements: ○ macronutrients – carbohydrate and fibre, fats (saturated, unsaturated, essential fatty acids), protein (complete and incomplete) ○ micronutrients – vitamins (A, C, D, E), minerals (iron, zinc, sodium). • Proportion of each food group to meet healthy eating guidelines. • Calorific value of: ○ fats: 9kcals/g ○ carbohydrates: 4kcals/g ○ protein: 4kcals/g ○ alcohol: 7kcals/g. • Dietary role of each nutrient. • Role of nutrients in energy and ATP production – aerobic and anaerobic metabolism. • The effect of different types of training on the production of fuel for exercise: ○ glycogen ○ phosphocreatine ○ amino acids ○ fatty acids.

1.4 Explain the concept of the glycaemic index	• Rating system for foods containing carbohydrates, which shows how quickly each food affects blood sugar (glucose) levels when that food is eaten on its own.
	• **High GI foods** – carbohydrate foods that are broken down quickly by the body and cause a rapid increase in blood glucose have a high GI rating. For example:
	  ○ sugar and sugary foods
	  ○ sugary soft drinks
	  ○ white bread
	  ○ potatoes
	  ○ white rice.
	• **Low and medium GI foods** are broken down more slowly and cause a gradual rise in blood sugar levels over time. For example:
	  ○ vegetables
	  ○ pulses
	  ○ wholegrain foods, such as porridge oats.

1.5 Explain the importance of maintaining blood sugar levels	• Balance mood.
	• Maintain energy levels.
	• Assist weight management.
	• Reduce the risk of health conditions, e.g. pre-diabetes, diabetes.
	  ○ **Symptoms:**
	  – high sugar levels (hyperglycaemia):
	  ▪ fatigue
	  ▪ feeling thirsty
	  ▪ having blurry vision
	  ▪ frequent/excessive urination
	  ▪ risk of ketoacidosis (diabetic coma)
	  – low sugar levels (hypoglycaemia):
	  ▪ shaking
	  ▪ sweating
	  ▪ nervousness or anxiety
	  ▪ irritability or confusion
	  ▪ dizziness
	  ▪ hunger.
	  ○ **Effects of prolonged high blood sugar levels:**

	– hormone response (insulin resistance) – kidneys (nephropathy – a complication of diabetes) – vision (retinopathy – a complication of diabetes) – risk of cardiovascular disease – risk of metabolic syndrome (obesity, high cholesterol, high blood pressure).

1.6 Describe the differences between simple and complex carbohydrates	• Simple carbohydrates:
	  ○ called simple sugars
	  ○ found in a variety of natural food sources, including fruit, vegetables and milk
	  ○ food with a sweet taste
	  ○ easy/quick to digest
	  ○ often provide no nutrition other than energy ('empty calories').
	• Complex carbohydrates:
	  ○ called starches
	  ○ found in wholegrain foods
	  ○ slower to digest
	  ○ often contain fibre
	  ○ more likely to contain nutrients other than energy.

1.7 Explain how diet can be used to maintain blood sugar levels	• Frequency of meals. • Food types (glycaemic index).
1.8 Explain the role of glycogen	• When blood sugar levels rise, the release of insulin causes excess glucose to be stored in the liver and muscles as glycogen. • When the body requires energy, glucagon breaks down glycogen back into glucose. • It therefore serves as an energy reserve by helping maintain blood sugar levels (especially during aerobic exercise).
1.9 Explain the role of cholesterol	• Plays a vital role in how every cell works and is also needed to make vitamin D, some hormones and bile for digestion.

1.10 Explain the risks associated with high cholesterol levels	• Too much cholesterol in the blood can increase your risk of getting heart and circulatory diseases.
	• Different types of cholesterol:
	  ○ low density (or non-high density) lipoproteins – unhelpful
	  ○ high density lipoproteins – helpful.
	• Foods and lifestyle choices lead to an increase in both types of cholesterol.

1.11 Describe the relationship between nutrition, physical activity, body composition and health	• Boundaries and responsibilities:
	  ○ when and how to seek further information
	  ○ when and how to refer individuals (see 2.6 and 3.2)
	  ○ health conditions listed are outside of scope of practice and should be signposted to a suitably qualified medical or nutrition professional, i.e. ANutr, RNutr, RD.
	• Health and disease risk factors linked with poor nutrition and physical inactivity:
	  ○ body composition (lean: fat tissue ratio)
	  ○ obesity
	  ○ type 2 diabetes
	  ○ cardiovascular disease (coronary heart disease, high blood pressure, high cholesterol, stroke)
	  ○ cancer
	  ○ eating disorders
	  ○ effects of cholesterol:
	  – plays a vital role in how every cell works and is also needed to make vitamin D, some hormones and bile for digestion
	  – too much cholesterol in the blood can increase your risk of getting heart and circulatory diseases
	  – different types of cholesterol:
	  ▪ low density lipoproteins – unhelpful
	  ▪ high density lipoproteins – helpful
	  – foods and lifestyle choices lead to an increase in both types of cholesterol
	  ○ effects of different type of fats:
	  – saturated
	  – monounsaturated
	  – polyunsaturated

	– hydrogenated fats – essential fatty acids - omega 3 and 6 ratio – effects of excess sugar, salt, etc. • Methods of altering energy intake (see 1.7/1.8 and 2.2). • Healthy food choices to support healthy eating and weight management (see 1.2).
1.12 Identify individuals and groups at risk of over and undernutrition	• Groups at risk: o iron deficiency: – vegetarians, vegans, menstruating women, pre-school children o iodine deficiency: – can lead to thyroid hormone production problems (e.g. may affect vegans, pregnant women) o vitamin D deficiency: - people with dark skin, people with little sunlight exposure o calcium deficiency: – young females and the elderly. • Signs and symptoms of over and undernutrition. • Cultural and religious dietary practices that will influence nutritional advice. • How to recognise the signs and symptoms of disordered eating and eating disorders.
1.13 Explain the importance of hydration to support physical activity and health	• Fluid requirements for different activity levels and environment. • Risks of dehydration. • Signs of dehydration. • Fluid sources for optimal hydration (including food sources containing water). • Benefits, limitations and suitability of different types of sports drinks (iso, hypo and hypertonic). • Hydration requirements for different goals.
1.14 Explain how portion sizes impact nutrient and energy intake	• Eatwell Guide recommendations and British Nutrition Foundation (BNF) resources on portion sizes. • Effects of altering portion sizes on health, energy and nutrient intake. • With consideration of: o energy balance equation (see 2.2)

	○ interpreting food labels to guide healthy eating.
1.15 Identify the impact of different food preparation and cooking techniques on nutrition and healthy eating	• Food preparation techniques and hygiene considerations. • Different cooking techniques, e.g. steaming, grilling, baking, frying, etc. • The impact of the above on nutrition and healthy eating guidelines.
1.16 Evaluate the limitations and risks of weight loss and fad diets	• The importance of communicating risks of diets to clients: ○ health and performance implications of diets that encourage severe energy restriction ○ how nutritional intake can influence the actions of certain metabolic hormones ○ short-term and long-term health risks of calorie restricted or macronutrient restricted diets ○ the impact of yo-yo dieting ○ emphasising the impact of advertising and the few success stories that are highlighted ○ long-term impact on hormonal and metabolic regulation ○ psychological impact of weight loss and weight gain and its impact on day-to-day life, e.g. lethargy, mood swings, emotional distress, etc. ○ provide basic information on thermodynamics and the essence of every diet, e.g. fewer calories consumed than expended will result in weight loss irrespective of the diet's name.
1.17 Explain the importance of regular eating patterns for a healthy and balanced diet	• Examples of different eating patterns and habits amongst individuals and groups. • The importance of maintaining regular eating patterns for a healthy and balanced diet.
1.18 Describe the health risks of excess alcohol	• Alcohol content and units in common measures. • Effects of excess intake on health. • Calorific value of alcohol and contribution of alcohol to energy intake (kJ/kcal). • Refer to responsible drinking guidelines – see Appendix 2: Information sources.
1.19 Explain the limits of safe practice when recommending dietary supplements (& performance aids)	• Evidence and limitations/risks related to the use of dietary supplements (and performance aids). • Conflicts of interest surrounding sale of dietary supplements (and performance aids) within the workplace. • See Appendix 2: Information sources.

2. Understand how to collect, analyse and use information relating to nutrition and health	
2.1 Outline how to educate and encourage clients to make healthy food choices, including the use of food labelling	• Use of appropriate communication methods. • Provide evidence-based information within own scope. • Know when, how and who to signpost clients to for more information. • The role of recognised nutrition professionals. • Protocols for the communication of nutrition information across the workforce. • Nutritional requirements for different goals, e.g. fat loss, weight loss, performance, hypertrophy. • How food label information can be used to support healthy eating. • Consideration of lifestyle management and client motivation and communication skills.

2.2 Explain how to calculate the energy requirements of individuals to support a balanced diet	• How energy requirements can vary depending on age, gender and activity level.
	• Methods of estimating resting metabolic rate and energy requirements:
	  ○ resting metabolic rate (RMR) or basal metabolic rate (BMR) – Schofield formula, etc.
	• How to estimate energy requirements based on physical activity levels and other relevant factors:
	  ○ Harris–Benedict equation (BMR x physical activity factor)
	  ○ physical activity factor:
	  – BMR x 1.4 inactive men and women (applies to most people in the UK)
	  – BMR x 1.6 moderately active women
	  – BMR x 1.7 moderately active men
	  – BMR x 1.8 very active women
	  – BMR x 1.9 very active men.
	• The nutritional requirements and hydration needs of clients engaged in physical activity.
	• Nutritional and hydration requirements for different goals.
	• The effect of different types of training on the production of fuel for exercise.
	• Energy balance and the importance of maintaining a balanced diet that follows healthy eating guidelines.

	• Components of energy expenditure and the energy balance equation:
	  ○ weight gain – a calorie surplus, whereby energy in is greater than energy out
	  ○ weight loss – a calorie deficit, whereby energy in is less than energy out
	  ○ weight maintenance – a calorie equality, whereby energy in is equal to energy out.
	• How to support individuals and groups to alter energy intake to support bodyweight goals and when to refer on.
	• Energy requirements to support the achievement of client goals.

2.3 Evaluate nutritional assessment tools used for educating and encouraging clients to make healthier food choices	• The uses, benefits and limitations (validity and reliability) of various dietary records and nutritional assessment tools:
	  ○ food diary
	  ○ food recall
	  ○ food frequency questionnaires
	  ○ body composition assessment
	  ○ technology
	  ○ Eatwell Guide.

2.4 Explain how to interpret information gained from methods used to assess body composition and health risk in relation to weight	• How to accurately measure body composition.
	• How different measures relate to nutritional intake.
	• The benefits and limitations of different measures:
	  ○ norm chart for body fat percentage and skinfold data - see American College of Sports Medicine (ACSM) within reference section
	  ○ World Health organisation (WHO) healthy ranges of body fat percentage, waist circumference and body mass index (BMI).
	• How to sensitively communicate information to clients.

2.5 Explore general strategies to support behaviour change to meet healthy eating guidelines	• Transtheoretical model – stages and processes to support individuals at each stage.
	• Relevant strategies at different stages, e.g. decisional balance, encouragement, goal setting, rewards.
	• Communication skills to support individuals at different stages:
	  ○ pre-contemplation:
	  – establish rapport and build trust

	– explore the pros and cons of maintaining current lifestyle – explore the meaning of the actions that the client undertakes ○ contemplation: – start to change the extrinsic motivations to intrinsic ones – elicit self-motivational statements of intent and commitment from the client – provoke ideas regarding the client's perceived self-efficacy and expectations regarding treatment ○ preparation: – offer a menu of options for change – help the client enlist social support – prompt from the client what has worked in the past either for him or others who he knows ○ action: – support a realistic view of change through small steps – assist the client in finding new reinforcers of positive change – acknowledge difficulties for the client in early stages of change ○ maintenance: – affirm the client's resolve and self-efficacy – maintain supportive contact – review long-term goals with the client.
2.6 Explain professional role boundaries and when and how to signpost clients	• Scope of practice: ○ general analysis of food diary ○ educating on the process of healthy eating (see 2.2) ○ provide recommendations to ensure client fits into 'healthy eating guidelines' ○ feedback on popular mainstream diets and analysis of their pros and cons ○ provide guidance on creating a calorie deficit or a calorie surplus. • Role boundaries:

	○ refer to experienced practitioner when client requests specific support, for example: – client presents with an eating disorder – client presents with an alcohol addiction – client presents with a medically controlled condition linked to nutrition, e.g. diabetes – client wants a specifically prescribed meal plan. • When and how to signpost/refer. • Range of professionals (ANutr, RNutr, RD). • Credible sources of nutritional information (see Appendix 2: Information sources).

3. Be able to collect and analyse nutritional information and make appropriate recommendations	
3.1 Use appropriate nutritional assessment tools to identify client's dietary habits	• See 2.3
3.2 Analyse client's dietary habits and identify areas for improvement within scope of practice	• Importance of informed consent prior to gathering information. • Using appropriate tools. • Information to gather from client: ○ goals ○ general physical activity levels ○ food likes and dislikes ○ any allergies ○ any cultural or religious food restrictions ○ timing of food intake ○ quantity of food intake ○ specific macronutrient content ○ any additional supplementation ○ medication being taken ○ water, caffeine and alcohol intake. • Provision of information within scope of practice (see Appendix 3: AfN code of practice).

3.3 Apply appropriate strategies to educate and encourage clients about healthy eating within scope of practice and current government guidelines	• See 2.5. • Use of appropriate lifestyle and behaviour change models. • Use of appropriate communication skills.
3.4 Distinguish between credible and non-credible sources of nutritional information and guidance	• See Appendix 2: Information sources.
3.5 Provide clients with appropriate information and/or signposting according to their individual health and nutrition needs	• See 1 and 2. • See Appendix 3: AfN code of practice.
3.6 Maintain records in accordance with appropriate legislation	• Data protection/general data protection regulation (GDPR).

Consultation and assessment for personal training (K/650/4863)

Unit aim

To develop the knowledge and skills to conduct consultations with clients, assessing their needs in order to plan and deliver personal training. This includes one-to-one and small groups.

Content

1. Understand the consultations and assessment process	

1.1 Describe the consultation process (subjective assessment)	• How to conduct a consultation, i.e. a subjective assessment:
	  ○ structure and timing of consultation
	  ○ appropriate environment
	  ○ consultation skills
	  ○ recording paperwork.
	• Information to gather from the client:
	  ○ personal: name, contact details, occupation, lifestyle, medical history, etc.
	  ○ health screening (PAR-Q+) to identify CVD risk factors and medical conditions, and possible reasons for deferral/referral
	  ○ dietary habits (basic nutrition)
	  ○ goals/aims/expectations
	  ○ exercise history (past and current), availability, likes/dislikes, etc.
	• Purpose of gathering subjective information during a consultation:
	  ○ to support planning for those ready to exercise
	  ○ deferral or signposting/referral (as needed).
	• Methods of gathering subjective information during a consultation:
	  ○ verbal:
	  – one-to-one discussion
	  ○ written:

	– completion of PAR-Q+, 24-hour recall or food diary – notes from other healthcare professionals, e.g. referral forms – devised questionnaires.
1.2 Describe consultation skills	• Empathy and positive regard of others. • Communication skills: o motivational interviewing o active and reflective listening o observation of body language and posture, etc. o questioning skills: – different types of questions, e.g. open, closed, reflective. • Time management.
1.3 Explain how to select and implement objective assessments	• Objective assessment: o physical/health assessments appropriate to individual: – include when to exclude assessments, e.g. if the risk outweighs the benefits, such as some fitness assessments. • Purpose of objective assessments: o to establish: – potential exclusions from exercise, e.g. health conditions beyond scope – potential limitations to exercise, such as functional and mobility limitations and need for modifications – a baseline against which any improvements can be measured – programming and planning, including reasons for deferral or signposting. • Methods of objective assessment: o health assessments: – resting heart rate – blood pressure – body mass index – waist circumference o functional assessments (where relevant), such as: – sit to stand

	– single-leg balance – timed up and go ○ fitness assessments (where relevant): – cardio-respiratory fitness – muscular strength – muscular endurance – flexibility – body composition ○ postural analysis (static and dynamic): – postural alignment – movement patterns ○ use of technological advances for supporting assessment and providing baseline information, e.g. body scanning devices ○ protocols for specific assessments to ensure validity, reliability, etc. ○ relevance of norm tables and information (as appropriate).
1.4 Know when and how to work with other healthcare professionals, when necessary	• To maintain client safety and support specific lifestyle and other needs that are beyond scope of practice. • Other professionals for signposting and referral, to include: ○ GPs ○ counsellors ○ dietitians ○ physiotherapists ○ sport massage professionals ○ other exercise professionals, such as exercise referral, long-term conditions, cardiac rehabilitation, genre specific, e.g. yoga, Pilates, aqua.

2. Be able to collect and analyse information to provide exercise, lifestyle and nutritional guidance to meet the needs of the client	

2.1 Ensure safety of client and professionalism is maintained at all times	• Correct procedures, protocols.
	  ○ the presence of a chaperone, if necessary
	  ○ informed consent
	  ○ duty of care
	  ○ cultural sensitivities.

2.2 Conduct a subjective assessment of client, to obtain:
• client's goals, motivators and lifestyle (including nutritional information)
• pre-exercise assessment screening
• informed consent
	• See 1.1.
	• Educate client on the purpose and value of pre-exercise assessments.
	• Select assessments appropriate to the individual client.
	• Select assessments appropriate to the assessment conditions/equipment/time available.
	• Assessment of nutritional intake:
	  ○ use appropriate nutritional assessment tools to identify client's dietary habits
	  ○ analyse client's dietary habits and identify areas for improvement within scope of practice
	  ○ application of nutritional strategies
	  ○ use appropriate strategies to educate and encourage clients about healthy eating within scope of practice and current government guidelines
	  ○ distinguish between credible and non-credible sources of nutritional information and guidance
	  ○ use appropriate products and IT to support and manage effective personal training.

2.3 Conduct an objective assessment of client: • explain purpose • use appropriate assessments	• See 1.2. • Educate client on the purpose and value of pre-exercise assessments. • Select assessments appropriate to the individual client. • Select assessments appropriate to the assessment conditions/equipment/time available. • Advise client of correct procedures, protocols and risks prior to commencing any physical assessment(s). • Supervise client's physical assessment in a safe and effective manner. • Conduct basic postural analysis on client.

2.4 Summarise the information obtained from subjective and objective assessments:
• written records
• electronic records
	• Interpret results/recorded data using accepted criteria.
	• Inform client of analysis outcomes and discuss and agree actions/goals, using language/terms understood by client/simplify technical information, effective use of communication and interpersonal skills.
	• Develop a summary profile of the client to assist in the design of a safe and effective programme tailored to their specific needs.
	• Client's suitability for exercise, including any possible limitations.
	• Recommendations based upon client's short-term and long-term goals.
	• Records to be maintained using an appropriate format:
	  ○ clear and structured
	  ○ to maintain a record of content.
	• For monitoring purposes, e.g. progression.
	• In the event of litigation.
	• Storage to align with GDPR and data protection guidelines.

2.5 Inform client of findings and discuss/agree a programme which is:
• tailored to their specific needs
• targeted to meet their goals
	• Present recommendations to client:
	  ○ proposed programme
	  ○ lifestyle
	  ○ nutritional advice within scope of practice, including signposting to other professionals, where appropriate.
	• Discuss and agree recommendations.
	• Modify/adapt, as appropriate.

Plan, deliver and evaluate personal training (M/650/4865)

Unit aim

To provide the knowledge and skills required to plan, deliver and evaluate health and fitness programmes suitable to a client's specific goals and fitness levels.

Content

1. Understand the principles of programme design	

1.1 Describe a range of fitness training techniques	• Exercises for all components of fitness.
	• Approaches to support different participant objectives:
	  ○ fitness
	  ○ health
	  ○ strength, endurance, hypertrophy
	  ○ weight management
	  ○ lifestyle improvement.
	• Different training approaches and effects on specific anatomical and physiological systems:
	  ○ cardiovascular exercise:
	  – steady state, interval, fartlek, HITT, aerobic, anaerobic fitness
	  ○ resistance exercise:
	  – a range of training systems (single sets, multiple sets, split routines, Delorme and Watkins [10RM], Berger [6RM], pyramid systems – ascending, descending and both, super-setting, giant sets, tri sets, forced repetitions, pre/post exhaust etc.), exercise equipment, fixed and free weights
	  ○ functional exercise:
	  – movement patterns, muscle actions and components of fitness which mirror a client's functional requirements.
	  ○ flexibility exercise:
	  – static, dynamic and proprioceptive neuromuscular techniques (including the

	myotatic/stretch reflex) to facilitate increased range of motion.

1.2 Describe the principles of training and how they relate to exercise programme design	• Methods of overload – specific to fitness components.
	• Importance of recovery to prevent overtraining, injury.
	• Training variables:
	  ○ 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.

1.3 Detail the different ways by which the intensity of exercise/activity can be altered **1.4 Describe** how the variables of training (FITT) can be used to tailor exercise/activity programmes to support achievement of goals	• 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, etc. • The effect of exercise variables on biomechanics and kinesiology – 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.

1.5 Outline the requirements of a personal training session	• Content:
	  ○ deliver exercise
	  ○ provide lifestyle advice and guidance
	  ○ provide dietary advice:
	  – use appropriate nutritional assessment tools to identify client's dietary habits

	– analyse client's dietary habits and identify areas for improvement within scope of practice – application of nutritional strategies – use appropriate strategies to educate and encourage clients about healthy eating within scope of practice and current government guidelines ○ session structure ○ check in with client ○ warm-up, main workout, cooldown ○ components of fitness ○ exercise selection ○ methods for obtaining feedback. • Method of presentation: ○ paper based ○ online ○ electronic or email or social media links.
1.6 Describe how to monitor and review a client's progress	• The use of regular assessments to monitor client progress towards goal achievement (including use of food diaries). • How to revise an exercise programme in consultation with a client based on results/goals/individual needs/changing circumstances. • Use appropriate products and information technology (IT) to support and manage effective personal training, e.g. record keeping, sales and invoicing, client and group management, class scheduling, retention levels, session reminders, data analysis/interpretation (and how to present it). • Maintain communication with clients between sessions. • Technological advancements that can be used to support the customer experience to increase physical activity levels, motivation and focus, e.g. wearable technology, pedometers, mobile phone applications.

2. Understand how to design and tailor exercise programmes for a range of clients within scope of practice	
2.1 Outline the advantages and disadvantages of exercising a range of	• sedentary • recovering from injury • over trained • high-level performer

clients at various intensities	• sport specific performer • clients with low-risk health conditions.

2.2 Explain how to apply the principles of training to exercise programme design to develop each component of fitness	• How to apply the principles of training (FITT-VP) to exercise programme design to develop:
	  ○ cardiovascular endurance
	  ○ muscular strength (hypertrophy and endurance)
	  ○ flexibility
	  ○ body composition
	  ○ posture
	  ○ core stability
	  ○ motor skills.

2.3 Describe a range of different protocols and tools which can be used in programme design	• Calculations of repetition maximums. • Methods of monitoring exercise intensity. • Repetition ranges. • Heart rate zones. • Recognised international guidelines. • Periodisation. • Use of technology.

2.4 Explain the implications which exercise may have on posture:
• core stability
• spinal disorders
	• Poor posture:
	  ○ places strain on the lower back muscles
	  ○ limits range of movement, leading to further muscle and joint damage (through compensation /overload).
	• A weak core:
	  ○ affects stabilisation, which limits balance
	  ○ places a greater load on fixator muscles (overuse) and increased recruitment of synergist muscles, leading to abnormal movement patterns (patterns of dysfunction)
	  ○ limits the effectiveness of prime mover muscles.

2.5 Explain how to set and adapt meaningful 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.

3. Understand how to design and deliver different modes of exercise in different environments	

3.1 Describe the requirements of different modes of exercise in different environments	• Different environments and available equipment:
	  ○ gym based
	  ○ studio based
	  ○ sports hall
	  ○ outdoors
	  ○ home based or confined space.
	• Exercise modes:
	  ○ resistance training (machines, free-weights, body weight)
	  ○ CV training
	  ○ circuit training
	  ○ body conditioning
	  ○ core exercise
	  ○ flexibility training, etc.

3.2 Explain how to risk assess the environment prior to a fitness session	Prior to any activity, walk the area, looking for potential hazards.
	• Indoor:
	  ○ surfaces:
	  – even, free from obstacles
	  – check for signs of water, liquids or other hazards that might cause slips, trips and falls
	  ○ exercise equipment
	  ○ space, sufficient room for proposed activities and the number of participants.
	• Outdoor:
	  ○ ground surfaces:
	  – holes
	  – cracks
	  – rocks
	  – slippery or uneven ground
	  – hazards, e.g. broken glass
	  – syringes
	  – rubbish
	  – dog excrement
	  – broken equipment

	○ weather: – lightning – heat – cold – rain – visibility.

4. Understand how to design sessions that can be delivered to small groups	
4.1 Outline safety considerations when designing group personal training sessions for small groups	• Environment: ○ space requirement ○ indoor versus outdoor activities: – how risks will be assessed. • Preparation of participants: ○ inform participants in advance of proposed environment and activities: – suitable clothing and footwear. • Proposed activities: ○ methods to monitor intensity of participants: – possible use of heart rate monitors. • Alternatives. • Methods of progression and regression.
4.2 Outline how to design small group personal training sessions	• Safe and effective: ○ warm-up and dynamic stretches ○ main component ○ cooldown and development stretches. • Consider the use of themes for motivation. • Consider components of fitness. • Individual client goals.
4.3 Explain how to balance the needs of the individual and the group	• Provide alternatives to individuals. • Consider the use of a set time as an alternative to number of reps as the goal for activities.

4.4 Outline how to modify and adapt instructional and communication skills to work with small groups	• Teaching position for demonstrations. • Voice projection when working with larger numbers. • Maintaining engagement of all individuals. • Eye contact with all individuals. • Allowing all individuals time to practice.

5. Be able to design an exercise programme which meets the needs of their client	

5.1 Design an appropriate programme for their client using the principles of training	• Plan sessions for individuals:
	  ○ appropriate timings
	  ○ incorporate teaching strategies to enhance client performance
	  ○ determine and vary modality and intensity of exercise
	  ○ allocate equipment/resources required
	  ○ link session to client goals (short-/medium--/long-term goals)
	  ○ incorporate warm-up and cooldown activities appropriate to the session/individual
	  ○ plan and deliver sessions in different environments:
	  – gym, studio/sports hall, community facility, outdoors, client's home or other confined space.

5.2 Use appropriate products/methods to **present** proposed plan to client	• Paper based. • Online. • Electronic. • All records to follow GDPR/DPA guidelines.
5.3 Agree with client(s) how the programme's effectiveness will be measured	• The methods to be used to review progress. • Frequency. • Schedule (dates).

6. Be able to design, deliver and review exercise programmes which meet the needs of a small group	

6.1 Design an appropriate programme for a small group using suitable fitness training techniques	• Plan sessions for small groups:
	  ○ appropriate timings
	  ○ incorporate teaching strategies to enhance client performance
	  ○ application of teaching and communication skills appropriate for groups, e.g. use of teaching position, eye contact with all participants, etc.
	  ○ determine and vary modality and intensity of exercise
	  ○ allocate equipment/resources required
	  ○ link session to client goals (short-/medium-/long-term goals)
	  ○ incorporate warm-up and cooldown activities appropriate to the session/individual
	  ○ plan sessions in different environments, to include:
	  – gym, studio/sports hall, community facility, outdoors, client's home or other confined space
	  – using appropriate techniques for components of fitness
	  – risk assessment
	  – appropriate use of space
	  – record sessions using appropriate format
	  – maintain records (GDPR).

7. Be able to observe and monitor client(s) during sessions to maintain safety and effectiveness of exercise	
7.1 Ensure that chosen environment is safe	• risk assessment • modifications to session plan.
7.2 Use appropriate teaching methods and skills to **instruct** planned programme	• Using explanations and demonstrations that are technically correct, safe and appropriate to the individual client. • Correcting exercise technique to ensure safe and effective alignment, execution and use of equipment. • Providing client specific instruction points, feedback, encouragement and reinforcement.

	• Offering adaptations and alternatives that meet a client's individual needs and circumstances (progression, regression, corrective strategies and alternative exercises, as required). • Modify and adapt exercises, sessions and programmes for a range of individual needs.
7.3 Demonstrate different methods of monitoring client(s)' progress during exercise	• Method of monitoring intensity, e.g. talk test. • Observation. • Questions.
7.4 Observe and adapt exercise techniques to ensure their: • safety • effectiveness.	• Observing and monitoring clients to ensure safety and effectiveness. • Utilising explanations and demonstrations that are technically correct, safe and appropriate to the client. • Correcting exercise technique to ensure safe and effective alignment, execution and use of equipment. • Providing specific instruction points, feedback, encouragement and reinforcement. • Offering adaptations and alternatives that meet a client's needs and circumstances (progression, regression, corrective strategies and alternative exercises, as required). • Modify and adapt exercises, sessions and programmes for individual needs.
7.5 Adapt verbal and non-verbal communication methods to ensure clients understand what is required	• Verbal – language and voice tone. • Non-verbal – body language, gestures, eye contact, etc.
7.6 Use motivational styles that are: • appropriate to the clients • consistent with accepted good practice	• Helpful and positive language. • Supportive.
7.7 Maintain a professional image	• Refer to unit – *Providing a positive customer experience to exercise and fitness participants*

8. Be able to review programme sessions to maintain their effectiveness	

8.1 Evaluate the effectiveness of the session to ensure it is engaging, varied and meets client's needs/goals	• How to gather and use information, and the benefit of conducting evaluation(s):
	  ○ information gathering sources (questionnaires, comment slips, verbal
	  ○ sources of information (self, participants, supervisors, peers)
	  ○ discussion of information with relevant personnel (studio coordinator/line manager).
	• Use of Kolb cycle.
	• Carrying out regular programme reviews meetings with clients to ascertain how well the exercise programme meets client needs/progress towards goals, any improvements that can be made to the programme plan, etc.
	• Evaluating and reflecting on planned programmes to ensure the physical and psychological needs of the individual are being met.
	• Monitor and review the outcomes of working with clients and taking into consideration participant feedback:
	  ○ gathering feedback from clients in verbal or written formats
	  ○ accepting feedback objectively
	  ○ offering credible advice and guidance appropriate to own level of expertise to promote positive healthy lifestyle choices
	  ○ signposting clients to other services if they show an interest in other areas/activities.
	• Identify:
	  ○ strengths and areas to develop
	  ○ ways to make improvements
	  ○ how well the exercises met client's needs
	  ○ the effectiveness of session structure and equipment for meeting client's needs
	  ○ how effective and motivational the relationship with the client was
	  ○ how well the instruction and communication style matched client's needs
	  ○ the safety and effectiveness of the programme and exercises, things that went well, as well as things to improve

	○ changes/adaptations to the session based on the appraisal of own performance ○ support needed, e.g. mentor, training, etc.
8.2 Outline how to use information to improve personal practice	• The value of reflective practice: ○ appraising and improving own performance and client's performance ○ retaining clients ○ aiding personal development ○ meeting client's expectations ○ ensuring programmes are safe and effective ○ identifying specific improvements to instructional skills and communication ○ identifying ways to improve session content for meeting client's needs, to include: – adaptation of plans to accommodate specific needs that the client may present – selection of exercises that are safe, effective and reflect current guidelines for good practice – provision of alternatives – providing advice to client(s) regarding safe and effective alignment of exercise positions.
8.3 Use appropriate methods to **monitor and review** client(s)' progress	• Maintain communication with clients between sessions to motivate, e.g. phone calls, emails. • Completed documentation: ○ screening forms ○ assessment records and outcomes ○ food diary. • Face to face. • Use of technology.
8.4 Review client(s) goals based on outcomes and revise programme accordingly	• Amend and improve future session plans and own performance based on evaluation and feedback from the client, e.g. according to chosen activities, exercise intensity, changes in circumstances, adherence to advice, etc. • Give feedback to client based on review: timely, positive, relevant to goals, etc.

Plan, deliver and evaluate outdoor training (J/650/4862)

Unit aim

To develop the knowledge and skills required to safely and effectively plan, deliver and review outdoor training (within scope of practice).

This may include:

- group training sessions, e.g. circuit training
- one-to-one training sessions.

Content

1. Understand principles for planning and delivering outdoor training sessions	

1.1 Describe different types and formats of session that can be delivered in different outdoor environments	• Different environments:
	  ○ parks
	  ○ forests/woodland
	  ○ beaches
	  ○ urban areas.
	• Types of session:
	  ○ group or circuit-based sessions
	  ○ one-to-one training
	  ○ walking and running.
	• Components of fitness that can be trained:
	  ○ cardiovascular fitness
	  ○ muscular fitness
	  ○ flexibility
	  ○ functional ability
	  ○ motor skills.

1.2 Explain a range of bodyweight exercises that can be used in outdoor training	• Exercises and alternatives for all components of fitness:
	  ○ cardiovascular – walking, stepping, jump jacks, squatting, lunging, running, etc.
	  ○ muscular strength and endurance – press-ups, abdominal curls, back extensions, etc. All major muscles

	○ flexibility – static and range of motions stretches for all muscles ○ motor skills – balance, coordination, power, speed drills, etc.
1.3 Identify a range of equipment that can be used in outdoor training	• Medicine balls. • Dyna-Bands. • Small hand weights. • BOSU ® ball. • Suspension equipment. • Gloves and pads. • Skipping rope. • Benches. • Steps. • Relevant safety and induction considerations when using different equipment. • Consideration of appropriateness of equipment to individual needs. • Lifting and handling.
1.4 Explain how environmental features can be used to adapt and progress exercises	• Trees, e.g. shuttle walks or press-ups, or to support balance when stretching. • Trim trails, e.g. monkey bars or swings. • Outdoor gyms, e.g. fixed equipment. • Gradients and hills, e.g. to increase intensity. • Benches and steps, e.g. for triceps dips, steps ups, etc. • With consideration of: ○ legally protected flora and fauna: – Conservation of Habitats and Species Regulations (2017). European protected animal species and their breeding sites or resting places are protected. It is an offence for anyone to deliberately capture, injure or kill any such animal or to deliberately take or destroy their eggs. It is an offence to damage or destroy a breeding or resting place of such an animal. – Wildlife and Countryside Act (1981). It is an offence to deliberately pick, collect, cut, uproot or destroy a wild plant of a protected species. It is also an offence for any purpose to possess, sell or exchange such a plant. ○ objects of significance:

	– the importance of not moving or damaging these objects – four primary criteria applied when assessing significance: ▪ historical (objects that have a proven association with a known individual, some event or period in history) ▪ aesthetic (objects may be considered significant for their beauty, patina of age, craftsmanship, style, design, technical accomplishment) ▪ scientific (research; refers to items of current scientific value or research potential, such as archives, natural history or archaeological collections) ▪ social value/meaning (objects held in community esteem for their cultural or social associations) ○ environmental degradation: – excessive erosion of riverbanks – exposure of tree roots and other hazards – wear and tear of footpaths.
1.5 Describe how training variables can be modified to accommodate different objectives	• Different participant demographics. • Participant objectives: ○ improve fitness ○ improve motivation ○ improve skills and techniques ○ improve health ○ fun and enjoyment. • The effects of different training approaches – linking to anatomical and physiological systems. • Variables and their effects on the above objectives: ○ frequency, intensity, time, type/specificity, volume, progression (FITT-VP). ○ total session time ○ timing of each component, e.g. warm-up, main workout, cooldown ○ work and rest ratio ○ active recovery/rest ○ transition time between exercises

	○ number of exercises ○ type of exercises ○ exercise order ○ speed of movement ○ range of movement ○ intensity ○ variety ○ progressions/regressions/adaptations/alternatives ○ muscle balance/targeting specific areas/objectives ○ inclusion of cardiovascular and resistance stations ○ social element/teaming-up/buddying.
1.6 Describe how partner or team activities can be used to enhance the outdoor training experience	• Use of trainer as partner for one-to-one sessions (if within scope). • Consideration of pairing for partner work, e.g. same height, fitness, etc. • Matching fitness and strength levels. • Different session approaches. • Creating an enjoyable environment. • With consideration of minimise competition which may impact motivation, self-esteem. • Can increase social element and build motivation and support, fun. • Example activities: ○ follow the leader ○ catch the leader ○ team relays ○ sparring ○ assist balance or support stretching, etc.
1.7 Describe essential considerations when planning and delivering outdoor training sessions	• Insurance: ○ personal/public liability. • Permission/license to use outdoor space: ○ process to follow ○ who to ask ○ understanding the responsibility for damage. • Use of music: ○ permission

	○ volume restrictions ○ time of day music is permitted/acceptable ○ appropriateness/type of music. • Health and safety and risk assessment: ○ environmental conditions, e.g. weather and temperature ○ knowledge of the environment ○ emergency locations ○ meeting points ○ toilets ○ shelter ○ other users, including animals ○ equipment use and management. • Outdoor hazards and risks – depending on environment: ○ broken glass ○ needles ○ animal faeces ○ animals, e.g. dogs, cows, goats ○ raised tree roots ○ loose branches ○ other natural resources: – sharp rocks, etc. • Weather: ○ sunburn ○ sun stroke ○ dehydration ○ hyper/hypothermia ○ frost bite. • Diseases ○ water-borne diseases ○ Lyme disease from ticks. • Infections from: ○ wounds ○ insect bites ○ snake bites. • Over-exertion:

	○ outdoor exercise can put additional strain on heart and lungs. • Pollution: ○ daily pollution from car exhausts, construction dust, factory fumes and bits of ozone can not only hurt your lung capacity, but it can also lead to asthma and an increased risk of lung cancer ○ early in the morning and later in the day are when pollution levels are at their lowest. • Plan a session appropriate to participant(s) goals and objectives: ○ consider how to monitor participant(s) performance and exercise intensity ○ relevant teaching and instructional skills and their application ○ group management for group sessions. • Safeguarding area: ○ safe entry and exit: – instructors to establish and make known safe entry and exit procedures: ▪ buddy system: - participant(s) should be encouraged to pair up ○ assistant/secondary leaders: – to share health and safety responsibility – command and control ○ safe landings: – sand, mud, water in case of falls ○ poor light conditions: – reflective clothing should be worn. – reflective stickers on obstacles – clearly mark out area with tape, cones, etc. ○ use landmarks: – mark out area and established meeting points, e.g. trees, lamp posts, benches. • Contingency planning: ○ weather:

	– it could freeze, meaning certain exercises/structure usage/features could be too dangerous ○ number of participants: – a greater or fewer participants could turn up – teaching skills may also need to be adapted, e.g. louder instructions to be heard by a larger group. • Other users of environment: ○ other users may cause disruption to the session, or the session may cause disruption to other users ○ the instructor should plan how any potential disruption will be dealt with and minimised. • Resources: ○ types: – individuals will have mixed fitness and ability levels ○ sufficiency: – in the event that there are more participants than originally planned.

2. Be able to plan outdoor training sessions	
2.1 Plan a safe and effective outdoor training session	• Outline the session objectives, SMART targets and review plans. • Targeted level, e.g. beginner. • Fitness components included: ○ cardiovascular exercise ○ bodyweight exercise ○ small equipment ○ functional exercise ○ flexibility and range of motion exercise (static stretching and mobilisation of joints). • Session structure: ○ warm-up (mobility, pulse-raising and muscle lengthening) ○ main section (components of fitness, appropriate exercises included, required equipment, layout, intensities, alternatives, etc.)

	○ cooldown (using appropriate stretches, including maintenance and developmental). • Additional risk assessment. • Environment: ○ how surfaces may be adversely affected by changes in weather/usage. • Number of instructors: ○ group safety ○ number of participants vs number of instructors ○ factors which may restrict or limit line of sight ○ to share responsibility for health and safety ○ better control risks ○ improve monitoring and control. • Designated instructors to ensure safe entry and exit. • Weather: ○ how temperature may impact on performance or health ○ how ice or rain may cause slips ○ need to consider alternate exercises/equipment, use of features/structures. • Time of day: ○ safety of participants in poor light conditions and in remote areas ○ consider the buddy system and additional instructors ○ ensure safeguards are visible in poor light conditions. • Participant(s): ○ check health conditions ○ analyse individual abilities ○ gain the contact details from every participant. • Valuables: ○ establish if there is a secure area to lock away valuables. • Changing rooms and toilets: ○ establish if there is safe, secure and private access to changing facilities/toilets ○ consider mixed sex of participants. • Infections/diseases/hygiene: ○ depending on state of the environment and planned use of natural features. • Availability of drinking water:

	○ establish if there are any drinking fountains/facilities within area ○ advise participants to bring their own bottle of water ○ instructor to take spare drinking water with them. • Nearby roads and traffic: ○ consider the safety of participants ○ consider any obstructions in relation to cars/motor bikes/cyclists. • Other users: ○ number of users ○ time of day environment is used most ○ types of users (children, adults, elderly, dog walkers) ○ likelihood of disruption to/from other users. • Clothing: ○ time of day, e.g. reflective clothing to be worn at times of poor light ○ weather, e.g. hats for sun and cold, and waterproofs for rainy and wet conditions. • Emergency procedures.
2.2 Provide suitable adaptations, including progressions and regressions of exercises, where appropriate	• With consideration of environment, type of session and participant(s) needs. • Frequency, intensity, time and type. • Alternative exercises. • Alternative equipment. • Modifications to repetitions, resistance, rate, range of motion.
2.3 Record programme plans in an appropriate format	• Records to: ○ be clear and structured ○ use an appropriate format. • To maintain a record of content: ○ for monitoring purposes, e.g. progression ○ in the event of litigation. • Storage to align with GDPR and data protection guidelines.

3. Be able to prepare to instruct outdoor training sessions	

3.1 Prepare self, the environment and equipment as appropriate to the session	• Self:
	  ○ professional demeanour, e.g. uniform and personal attributes, positive first impressions
	  ○ an ambassador for the sector, leading by example and displaying positive health behaviours.
	• Environment and equipment:
	  ○ written and dynamic risk assessment record, to outline:
	  – potential hazards
	  – who may be harmed
	  – likelihood and severity of risk
	  – control measures
	  – if risks can't be controlled personally, then speak to the responsible individual within the facility
	  – appropriate layout of equipment for group exercise sessions.
	• Emergency action planning:
	  ○ medical:
	  ○ heart attack, etc.
	  ○ accident:
	  – fall
	  – trip, etc.
	  ○ missing person:
	  – participant lost their way due to poor light conditions
	  – participant did not follow given safeguarding procedures
	  ○ fire:
	  – forest fire
	  – caused by a cigarette, etc.
	  ○ environmental:
	  – fallen tree
	  – ice, etc.
	• Minimising disruption from other users:
	  – clearly mark out the exercise area to reduce trespassers

	– have paper copies of license/permission to use environment so they can be shown to anyone who asks – check the area for any tampering just before the session commences ○ minimising disruption to other users: – when planning, avoid heavily populated areas used regularly by others ○ time: – plan timings when other users are least likely to be in the area and at a time which does not cause disruption to the surrounding neighbourhood ○ noise: – keep noise to a minimum. Use suitable voice and music volume levels (if used) and ensure appropriate voice volume levels of participants. • Other safeguards: ○ reflective clothing increases visibility to other participants, other users, cars and cyclists ○ buddy system: – pairing/grouping participants encourages participants to stay close together to be able to keep an eye on each other, minimising the chances of getting lost or having an accident – the buddy will be able to seek help on the other participant's behalf in the event of an emergency ○ additional instructors ○ command and control: – ensure that participants are not too far apart. • Established meeting points: – the instructor should always establish and make the meeting points clear to participants should anyone get lost or need help.
3.2 Verbally screen participant(s) and use information to provide guidance	• Welcome participant(s). • Check readiness to participate. • Check for any changes since completion of a written PAR-Q+. • Reasons for deferral or referral. • Outline aims and objectives of session.

	• Opportunities for questions. • Health and safety advice, e.g. drinking water, maintaining body temperature or using layered clothing or sun protection, as appropriate to the environment, etc. • Raise awareness of any natural obstacles, such as uneven terrains and shelters, toilet facilities (as required).

4. Be able to deliver outdoor training sessions	
4.1 Engage participant(s) from the outset using effective communication to help participants feel welcome and at ease	• With consideration of the environment as well as gaining and maintaining participant(s) attention. • Effective communication skills. • Effective group management for group sessions. • Polite and professional. • Demonstrating active listening skills. • Giving clear and concise explanations for exercises.

4.2 Deliver a safe and effective warm-up for an outdoor training session	• With consideration of the environment and temperature.
	• Warm-up – overall body approach, including mobility, warming and appropriate muscle lengthening and range of motion exercise to achieve objectives.
	• Establish and maintain appropriate exercise intensity.
	• Manage time effectively.
	• Consideration of:
	  ○ participant fitness levels and appropriate modifications and teaching skills
	  ○ intensity of workout
	  ○ temperature/environmental conditions.

4.3 Deliver a safe and effective main workout for an outdoor training session	• With consideration of the environment and temperature.
	• Main section – overall body approach, including all muscle groups, and aim for muscle balance to achieve objectives.
	• Use of appropriate exercises to achieve goals and improve components of fitness:
	  ○ cardiovascular and muscular exercises
	  ○ bodyweight exercise
	  ○ small equipment, e.g. use of mats for core/abdominal exercise
	  ○ functional exercise, e.g. movement patterns/muscle actions/components of fitness required for activities of daily living.

	• Make use of suitable equipment and environment (as appropriate to the session format and type).
	• Establish and maintain appropriate exercise intensity.
	• Manage time effectively.
	• Consideration of:
	  ○ participant fitness levels and appropriate modifications and teaching skills
	  ○ intensity of workout
	  ○ temperature/environmental conditions.

4.4 Deliver a safe and effective cooldown and ending for an outdoor training session	• With consideration of the environment and temperature, which may demand 'keeping warm' while cooling down.
	• Appropriate exercise selection for environment.
	• Cooldown – lowering intensity, maintenance and developmental stretches to achieve objectives.
	• Flexibility and range of motion exercise (static stretching and mobilisation of joints).
	• Consideration of:
	  ○ participant fitness levels and appropriate modifications and teaching skills
	  ○ intensity of workout
	  ○ temperature/environmental conditions.
	• Provide participant(s) with feedback to end the session:
	  ○ strengths
	  ○ areas for development
	  ○ praise/positive reinforcement
	  ○ performance during the session
	  ○ future needs/goals.
	• Give the participant(s) the opportunity to:
	  ○ reflect on the session
	  ○ ask questions
	  ○ provide feedback
	  ○ identify further needs.
	• Leave the environment in a condition acceptable for future use:
	  ○ ensuring any environmental features that may have been moved are returned to the usual position and are not damaged
	  ○ wiping down and packing away of portable equipment

	○ reporting any maintenance issues ○ leaving the area safe, clean, tidy and ready for other users.
4.5 Demonstrate and explain safe and effective exercise technique	• Use explanations and demonstrations that are technically correct, safe and appropriate to the individual participant's needs and experience. • Consider different learning styles – visual, auditory and kinaesthetic. • Use motivational and communication styles appropriate to the participants and the exercise format. • Adapt communication style, attitude and responses to suit participants and their specific needs. • Professionalism, adherence to code of conduct (specific greetings/procedures), good manners, appropriate language and friendly attitude.
4.6 Use voice projection, volume and pitch relative to the environment	• Voice projection to ensure all participants can hear. • Use of visual communication to support verbal instruction.
4.7 Use appropriate teaching positions and instructional methods to **observe and monitor** participant(s) and respond to their needs	• Ensure that they can see the participants and that participants can see them. • Changing teaching position with consideration of the environment and number of participants. • Organisation with consideration of number of participants. • Communicate with consideration of different learning styles – visual, auditory and kinaesthetic. • Observe, monitor and engage with participant(s) to ensure safety and effectiveness. • Observe movement and exercise technique to ensure safe and effective alignment, execution and use of equipment. • Provide general and specific instruction points, feedback, encouragement and reinforcement in a friendly, professional manner. • Reinforce teaching points. • Correct and reinforce technique for safety and effectiveness. • Asking questions to check participant(s) understanding, as appropriate. • Verbal and visual communication to improve technique. • Mirroring (as appropriate). • Monitor intensity using appropriate methods (benefits and limitations):

	○ talk test ○ Rating of Perceived Exertion (RPE). ○ heart rate monitoring and target heart rate zones.
4.8 Provide alternatives, modifications and progressions of exercises, as appropriate	• Modification with consideration of the environment, e.g. use of environmental features. • Offer adaptations and alternatives to meet individual needs and improve performance (progression, regression, corrective strategies and alternative exercises, as required). • Use of FITT-VP principles. • Layering of information. • Modification according to individual needs, such as: ○ speed ○ levers ○ exercise position ○ repetitions ○ resistance ○ range of motion ○ alternative equipment.

5. Be able to review the session and reflect on practice	
5.1 Evaluate the effectiveness of the session to ensure it is engaging, varied and meets client(s)' needs/goals	• How to gather and use information, and the benefit of conducting evaluation(s): ○ information gathering sources (questionnaires, comment slips, verbal) ○ sources of information (self, client(s), supervisors, peers) ○ discussion of information with relevant personnel (studio coordinator/line manager). • Use of Kolb cycle to evaluate the session. • Carrying out regular programme review meetings with client(s) to ascertain how well the exercise programme meets client needs/progress towards goals, any improvements that can be made to the programme plan, etc. • Evaluating and reflecting on planned programmes to ensure the physical and psychological needs of the individual are being met. • Monitor and review the outcomes of working with client(s) and taking into consideration client feedback:

	○ gathering feedback from client(s) in verbal or written formats ○ accepting feedback objectively ○ offering credible advice and guidance appropriate to own level of expertise to promote positive healthy lifestyle choices ○ signpost client(s) to other services if they show an interest in other areas/activities. • Identify: ○ strengths and areas to develop ○ ways to make improvements ○ how well the exercises met client(s)' needs ○ the effectiveness of session structure and equipment for meeting client needs ○ how effective and motivational the relationship with the clients was ○ how well the instruction and communication style matched clients' needs ○ the safety and effectiveness of programme and exercises, things that went well as well as things to improve ○ changes/adaptations to the session based on the appraisal of own performance ○ support needed, e.g. mentor, training, etc.
5.2 Outline how to use information to improve personal practice	• The value of reflective practice: ○ appraising and improving own performance and participants' performance ○ retaining participants ○ aiding personal development ○ meeting participants' expectations ○ ensuring programmes are safe and effective ○ identifying specific improvements to instructional skills and communication ○ identifying ways to improve session content for meeting client needs, to include: – adaptation of plans to accommodate specific needs clients may present – selection of exercises that are safe, effective and reflect current guidelines for good practice – provision of alternatives

	– providing advice to client(s) regarding safe and effective alignment of exercise positions.

Business acumen for health and fitness professionals (F/650/7416)

Unit aim

This unit aims to provide knowledge and understanding to establish and sustain a health and fitness business.

Content

1. Understand marketing strategies, techniques and market research for business planning and promotion	

1.1 Describe how a health and fitness business may use marketing as a tool for business development	• The benefits and uses of marketing:
	  ○ to increase sales, revenue and profit, increase brand awareness, increase market share and gain a competitive edge over other similar businesses
	  ○ to launch new products and/or services, promote offers to existing customers
	  ○ to target specific markets and/or attract new customers.
	• The importance of developing a marketing plan:
	  ○ to outline marketing targets, timelines and how to achieve them
	  ○ to focus the development and direction of the business
	  ○ to identify and respond to customer needs and wants
	  ○ to formalise ideas and concepts for products and/or services
	  ○ to help obtain finance for new initiatives.
	• With consideration of the marketing mix:
	  ○ product (what and who):
	  – customers' needs, wants and expectations
	  – features, uses, appearance, size
	  – differentiation from competitors
	  ○ place (where):
	  – where the product and/or service will be available
	  ○ price (how much):
	  – the value of the product or service to the buyer

	– the cost to produce or deliver profit margins. • Promotion (message and market): ○ the marketing message ○ reaching target market ○ best time to promote.
1.2 Consider the types and sources of market research and their value in developing the business idea and creating a marketing plan	• Types and sources of market research: ○ qualitative – captures the thoughts and feelings of customers: – open ended questions, customer perception surveys ○ quantitative – numerical data, easy to measure: – sales data, usability testing results, audits ○ primary – carried out directly with customers: – observations, questionnaires, interviews, focus groups, mystery shoppers ○ secondary – gathered from desk-based activities or third parties: – online research, business literature, business reports and data, competitor analysis, government reports. • Research methods to identify the needs and expectations of potential customers, with consideration of: ○ demographics (age, race, religion, gender, income, etc) ○ geographic (location) ○ psychographic (social class, attitudes, lifestyle, personality) ○ behavioural (spending, consumption, usage, loyalty). • Tools and techniques: ○ analysis techniques: – descriptive statistics, such as mathematical calculations, e.g. average, percentage and range – use of visual elements, e.g. charts, graphs, maps – patterns and trends in feedback ○ analysis tools: – manual, e.g. entering data into software and using software functions to analyse and interpret data, such as spreadsheets and

	customer relationship management (CRM) systems – automated, e.g. web-based data analysis tools, such as reviews, comments, product ratings. • The reasons for identifying the market that buys into your business purpose. • Markets, such as business to consumer (B2C), business to business (B2B), business to government (B2G), etc. • Reasons: o to develop effective marketing strategies and communications for target market o to focus marketing activities to optimise reach o to ensure more cost-effective marketing strategies o to compete successfully in under-served markets.

2. Understand how to promote and sell health and fitness services and products	
2.1 Summarise the stages of the sales cycle	• Prospecting: o new – potential clients who have not previously used your services o old – potential clients who are no longer actively engaged with services o existing – promoting additional products and/or services to clients already engaged and using services. • Setting appointments: o researching prospect organisation and/or individuals o initiating contact with key decision-makers o date, time, location. • Qualifying: o identifying products and/or services which suit needs of the prospect o confirming that prospect is able and willing to buy. • Presenting: o background, including client work successes o what you can do o evidence of credibility, including success stories o sell the results rather than the package. • Handling objections:

	○ type of objection – real or stalling tactic ○ reasons for objections – need, urgency, trust, money. • Closing: ○ identifying buying signals – questions, behaviours, body language ○ types of close – alternative close, assumptive close, best-time close, compliment close, conditional close, daily cost close, emotion close, ownership close, quality close, similarity close, valued customer close ○ negotiation strategies – problem solving, contending, yielding, compromising, inaction ○ negotiation outcomes – defeat, collaborate, accommodate, withdraw. • Asking for referrals (when appropriate): ○ personal recommendations ○ leaving business information, e.g. business card, flyer, poster.
2.2 Identify the importance of understanding the needs and expectations of health and fitness services for different demographics	• The importance of identifying client needs and expectations in relation to services offered: ○ needs – a problem a potential client is looking to solve by purchasing health and fitness services, such as weight loss, increase physical activity, improve muscle strength, improve health ○ expectations – the perceived value a client seeks from services, such as pre-training assessments, progressive training plan, motivation and support to achieve fitness goals ○ importance – tailoring training services, increasing client motivation and retention, increasing sales and referrals, improving client satisfaction, assisting resolution of complaints ○ demographics, and example needs: – age – mobility limitations, adapted activities, concessions – religion – gender specific sessions and training spaces, specific clothing requirements – gender – gender specific training sessions and activities – family size – multiple members, family membership, differing client needs (children, adults) – income – ability to pay.

	• The importance of giving clients the opportunity to ask questions and discuss the services and their benefits:
	  ○ questions may include – qualifications, experience and successes, cost of services, potential results and speed, most appropriate exercise to achieve desired results, frequency of training, nutrition
	  ○ importance – gain full understanding of available services, match health and fitness services to the needs and expectations of customers, clarify uncertainties, resolve objections.
	• The use of terms and contracts, and their importance:
	  ○ methods of agreeing terms – face-to-face/verbal, written contract, digital
	  ○ terms to be agreed:
	  – parties of the contract (seller and buyer)
	  – contract start date and duration, level of commitment required
	  – definitions and key terms used in the contract
	  – services being provided, including training objectives
	  – payment amount, payment date and payment method
	  – lateness policy
	  – cancellation policy, including notice periods and conditions of cancellation
	  – health, safety and security arrangements
	  ○ importance – minimise legal disputes, comply with relevant legislation, match services to customer expectations, create certainty, cover important points, enforce conditions of agreement.

2.3 Explain how to communicate the benefits of the health and fitness service	• The advantages and disadvantages of different promotional activities/ways of communicating, with consideration of audience reach and needs, appeal to audience, design and development costs, time to publish, etc.
	• Use of social media:
	  ○ advantages – wide reaching communication, create groups, market health and fitness services
	  ○ disadvantages – privacy and confidentiality of information, no filter for information posted or opinions of others
	• Press release:

	○ advantages – communicates importance, communicates through main news channels such as television, radio, newspaper and social media networks at the same time ○ disadvantages – costly, communicates to press who choose to attend, depends on other events taking place at the same time • Flyer/poster: ○ advantages – visual imagery to attract attention, can be any size, markets the brand ○ disadvantages – cost to produce and display, creative ability of designer. • Digital marketing: ○ advantages – instantaneous once published, numerous digital marketing channels, can include audio visuals, not just text and images ○ disadvantages – accessibility to those less technologically savvy, such as elderly or those with visual impairments or disabilities; can be expensive to produce. • Competitions: ○ advantages – ignites excitement and belief of winning, gets potential prospects talking, provides contact details of potential prospects ○ disadvantages – for every winner there are always losers, which may have a negative effect, appeals to those who like entering competitions. • Cold calling: ○ advantages – not geographically limited, volume sales in a short period of time ○ disadvantages – irritates customers, causes anxiety for vulnerable groups, customer may be on the register to prevent cold-calling, easy to object to unsolicited sales attempts, can be illegal or unethical. • Referrals internally: ○ advantages – saves time, effort and money, attracts clients familiar with the service, reaches more people, easier to present to and close the sale ○ disadvantages – awareness of negative points, may require incentives, which can be costly, can become overly competitive. Please note: The example advantages and disadvantages are examples only; the list is not exhaustive.

2.4 Explain appropriate promotional activities to engage, gain and retain clients	• Promotional activities to engage, attract and gain clients:
	  ○ introductory offers and discounts
	  ○ free gifts
	  ○ free trials.
	• Promotional activities to retain clients:
	  ○ loyalty rewards
	  ○ complimentary services, e.g. free PT sessions
	  ○ discounted additional products and/or services, e.g. nutritional products, sports therapy.

2.5 Outline how to create a brand image in the marketplace that clearly identifies the business	• Brand definition:
	  ○ identifies the business and its values
	  ○ helps customers recognise the business over others
	  ○ reflects customer service standards
	  ○ creates brand loyalty.
	• Creating a brand image:
	  ○ determine business goals
	  ○ create brand identity and persona, e.g. how the business wants to be seen by its customers
	  ○ consider business drivers and key messages
	  ○ be unique, innovative, bold and consistent
	  ○ build long-term relationships.

3. Know the principles of business planning and business financials	

3.1 Describe the principle uses of business planning to develop and grow a business	• A business plan is a written document that describes:
	  ○ the business objectives and strategies
	  ○ sales, marketing and financial forecasts.
	• Purpose:
	  ○ helps run the business using direction and vision
	  ○ helps secure finance and investment from the following audiences:
	  – banks, external investors (friends), venture capitalists, grant providers, prospective buyers for the business, business partners, employees, shareholders, suppliers.
	• Content of a business plan:
	  ○ executive summary

	○ mission statement ○ organisational structure (personnel, shareholders, etc.) ○ business objectives and targets (sales and quality). SMART business objectives may relate to: – revenue through health and fitness services contracts – referral rates – customer satisfaction and/or perception results – linked product sales – package upgrades – retention of clients – success rates of clients – minimise waste – action planning to meet objectives. • Marketing and sales strategy (see 1 and 2). • Financial forecasts – cash flow and income, expenditure (fixed and variable costs).
3.2 Describe various activities that can support achievement of business objectives and business growth	• Marketing and promotional activities (see 1 and 2): ○ to grow customer base – target and attract new customers, retain existing customers ○ to diversify – offer different but linked products and services ○ to expand geographical locations ○ to innovate and use technology to improve efficiency. • The uses of performance measurement tools and techniques used to monitor achievement of business objectives: ○ areas to measure: – customers and customer service – market share and competitors – financial performance. • Performance measurement techniques: ○ competitor analysis: – products and services – price – quality and service standards – reliability – reputation

	– location – branding – sales approach ○ analysis tools – PESTLE (political, economic, social, technological, legal, environmental) – SWOT analysis (strengths, weaknesses, opportunities, threats). • Customer satisfaction and/or perception: ○ other measurement tools/sources: – benchmarking – key performance indicators – quality standards, quality assurance, quality control – 360° feedback and self-assessment. • Internal and external audit: ○ regularly monitor and review performance against objectives and set business targets, including individual and team targets. • Uses of performance measurement tools and techniques: ○ to assess strengths and weaknesses ○ to identify when and where to focus attentions to improve performance ○ to identify staffing needs ○ to align strategy to real performance.
3.3 Identify legal and regulatory requirements for different types of businesses	• Legal responsibilities of `self-employed` status: ○ register with HM Revenue and Customs (HMRC) ○ keep accurate financial records of income and expenditure ○ submit annual taxation returns to HMRC. • Other legal and regulatory requirements: ○ Health and Safety at Work Act (1974) ○ Data Protection Act (2018) ○ Consumer Protection Act (1987) ○ Equality Act (2010) ○ intellectual property (IP) ○ patents and copyright.

	• Different types of business operation and their advantages and disadvantages, e.g. freelance, partnership, sole trader.
	• Business records and their importance:
	  ○ documentation – leads, enquiries, referrals, sales and invoicing, client management, consultation and screening, informed consent, client contract, session scheduling and reminders, fitness programme and progress record, accounting and financial records
	  ○ the use of appropriate IT systems and products to support and manage all aspects of a health and fitness business (as above)
	  ○ importance – tracking clients and progress, following up on leads, legally protect the interest of the service provider and client in the event of dispute.
	• How data can be monitored and interpreted using a range of available systems, e.g. customer relationship management (CRM), social media.

3.4 Explain how to manage own business financials	• Budgeting and forecasting:
	  ○ start-up costs:
	  – business premises (deposits, maintenance, rent)
	  – machinery, equipment and resources
	  – relevant licenses and insurances
	  – business vehicle (purchase, insurance)
	  – legal expenses
	  – creating the brand image (logo and marketing materials).
	• Finance and investment:
	  ○ types of funding and investment (short-term and long-term)
	  ○ sources of finance and investment (small business grants, angel finance, crowdfunding, business loans, peer lending, venture capital, leasing).
	• Forecasting sales and targets, profit and loss:
	  ○ the benefits of carrying out a cost-benefit analysis (CBA):
	  – ensure planned products, services or business ventures are financially viable
	  – benefits must outweigh costs
	  – informs business decision making.
	• Financial reporting (self-employed and employed requirements).

	• HMRC business accounting requirements for self-employed.
	• Bookkeeping:
	  ○ types of accounting – declaring and recording income and expenses
	  ○ types of records – sales and income, business expenses, VAT records, if registered, PAYE records, if staff employed, records of personal income
	  ○ archiving business accounts – at least five years after January 31st submission.
	• Registering with the HMRC (refer to current HMRC guidance).
	• HMRC taxation returns (refer to current HMRC guidance).
	• Financial accounting terminology:
	  ○ gross income = all income from all sources (including business expenses)
	  ○ taxable income = gross income less deductions and exemptions
	  ○ net income = income less all business expenses
	  ○ break even = sales cover all business costs (no profit and no loss)
	  ○ income tax = tax you pay on your income: money earned from employment, profits you make, if self-employed, employee benefits, e.g. company car, pension
	  ○ Pay as You Earn (PAYE) = current personal allowances and tax rates
	  ○ Value Added Tax (VAT) = calculations and thresholds
	  ○ National Insurance contributions = different classes based on earnings
	  ○ HMRC allowable expenses, e.g. travel, advertising and capital allowances, such as equipment and business vehicles
	  ○ IT systems that can be used to support and manage finance and accounting.

4. Be able to plan, implement, review and adapt strategies to gain and retain clients and ensure business sustainability	

4.1 Use market research to identify a viable health and fitness product or service using relevant methods, tools and techniques	• Using techniques and areas identified in 1 and 3:
	  ○ market research
	  ○ analysis techniques and tools
	  ○ PESTLE and SWOT analysis
	  ○ competitor analysis.
	• Types of clients who might be interested in the services and benefits promoted.

4.2 Develop a marketing plan and campaign to promote the business	• Implement strategies to successfully:
	  ○ engage, gain and retain clients
	  ○ promote and sell products and services
	  ○ ensure the development and sustainability of the client base
	  ○ meet business goals and targets.
	• With consideration of:
	  ○ marketing mix (see 1)
	  ○ SMART objectives (see 1)
	  ○ identifying target audience(s)
	  ○ communication channels
	  ○ brand image
	  ○ clear and consistent content and messaging
	  ○ monitoring and tracking campaign successes.

4.3 Evaluate the effectiveness of strategies used to support future business development and goals	• Review business performance and identify areas for improvement.
	• The importance of regular reviews, with consideration of the effectiveness of strategies used to:
	  ○ engage, gain and retain clients
	  ○ promote and sell products and services
	  ○ ensure the development and sustainability of the client base
	  ○ meet business goals and targets.
	• Present, analyse and interpret data and information in line with professional practice:
	  ○ use of IT systems to support and manage all aspects of a health and fitness business such as record keeping, sales

	and invoicing, client management, session scheduling and reminders, retention levels ○ manage the effectiveness of a client's exercise programme ○ use appropriate products to support and manage clients effectively. • Make recommendations to support future business goals and development.

Appendix 1: Example gym-based exercise list

Resistance machines	Free weight
• Leg press • Seated adductor • Seated abductor • Total hip – adduction, abduction, flexion, extension • Seated knee extension • Leg press • Supine lying chest press • Seated chest press (BB grip) • Pec dec • Seated chest press (neutral grip) • Lateral pulldown (in front of the chest) • Assisted pull-up • Seated row (low pulley) • Seated row (neutral grip) • Seated row (BB grip) • Shoulder press • Abdominal machine • Lower back machine	• Lunge (BB, DB) • Deadlift (BB, DB) • Squat (BB) and (DB) • Calf raises • Supine triceps press (BB) • Single arm triceps press (DB) • Tricep kickbacks (DB) • Single arm overhead tricep press (DB) • Single arm tricep kickback (DB) • Supine tricep extension (BB) • Biceps curl (BB, DB) • Bench press • Supine chest fly (DB) • Single arm row • Bent over row (BB) • Prone fly (DB) • Shoulder press (DB, BB) • Lateral raise (DB) • Upright row (BB) • Front shoulder raise (DB) • Lateral shoulder raise (DB) • Spotting for bench lifts (BB, DB) • Correct lifting and passing for bench lifts (BB, DB) • Lifting the barbell safely from the floor to thigh level and overhead

Bodyweight	Cardiovascular exercises

• Lunge
• Squat
• Calf raises
• Press-ups
• Triceps dips
• Chins
• Prone fly
• Abdominal curl
• Obliques curl
• Reverse curl
• Plank
• Back raise
	• Cardiovascular machines:
	  ○ recumbent cycle
	  ○ upright cycle
	  ○ cross trainer
	  ○ elliptical machine
	  ○ rower
	  ○ stepper
	  ○ treadmill
	• Bodyweight (high and low impact versions):
	  ○ side lunges
	  ○ jump jacks
	  ○ back lunges
	  ○ spotty dogs
	  ○ marching and jogging
	  ○ knee raises
	  ○ leg curls
	  ○ skaters
	  ○ squats – wide legged and narrow legged
	  ○ squat thrusts
	  ○ burpees

Appendix 2: Information sources

Please note: While the information sources listed are available at the point of development/publication, access to specific website pages will change over time, as will the relevance of information.

Information sources and organisations:

- American College of Sports Medicine (ACSM): www.acsm.org/
- Association for Nutrition: www.associationfornutrition.org/
- Beat Eating Disorders: www.beateatingdisorders.org.uk/
- British Diabetic Association- Diabetes UK: www.diabetes.org.uk
- British Heart Foundation: www.bhf.org.uk
- British Nutrition Foundation: www.nutrition.org.uk/
- Cannabidiol (CBD) warning: www.ukad.org.uk/cannabidiol-cbd
- CIMSPA: www.cimspa.co.uk/
- Department of Health: www.dh.gov.uk
- Drinkaware: www.drinkaware.co.uk
- Glycaemic Index: www.glycemicindex.com
- Health Development Advice: www.hda-online.org.uk/
- Informed sport website: sport.wetestyoutrust.com/
- International Obesity Taskforce: www.iotf.org
- National Institute of Health and Care Excellence (NICE): www.nice.org.uk/
- National Library of Medicine: www.ncbi.nlm.nih.gov/pmc/articles/PMC3943438/
- National Library of Medicine: pubmed.ncbi.nlm.nih.gov/18049985/
- NHS Eatwell Guide: https://www.nhs.uk/live-well/eat-well/food-guidelines-and-food-labels/the-eatwell-guide/
- Research gate: www.researchgate.net/figure/Components-of-total-daily-energy-expenditure-TDEEBMRbasal-metabolic-rate_fig1_260397860
- Scientific Advisory Committee on Nutrition: https://www.gov.uk/government/groups/scientific-advisory-committee-on-nutrition
- UK Anti-Doping (UKAD) guidance: www.ukad.org.uk/athletes/managing-supplement-risks
- WADA prohibited substances: www.wada-ama.org/en/prohibited-list
- World Anti-Doping Agency (WADA) guidelines: www.wada-ama.org/en
- World Health Organisation (WHO): www.who.int/

Textbooks:

- American College of Sports Medicine, Liguori, G., Feito, Y., Fountaine, C., & Roy, B. A. (2022). *ACSM's guidelines for exercise testing and prescription* (11th edition). Wolters Kluwer.
- Bean, A. (2010). *Anita Bean's sports nutrition for women*. A & C Black.
- Bean, A. (2014). *Food for fitness : how to eat for maximum performance* (4th edition). Bloomsbury.
- Bean, A. (2022). *Complete guide to sports nutrition (9th edition)*. Bloomsbury sport.

Appendix 3: AfN code of practice

Source: Association for Nutrition (AfN:2022)

Code of practice (compulsory)

1. Students must know and be able to demonstrate their understanding of the boundaries of their role and responsibilities, including:

a) Working within the limits of their knowledge, competence and skills.

b) Understanding the boundary of their role and when/how to refer on as appropriate.

c) The need to seek supervision when situations are beyond their competence and authority.

d) Promoting and demonstrating good practice as an individual and as a team member.

e) Being accountable for their own decisions and behaviours.

2. Students must know and be able to demonstrate their understanding of the need to maintain their levels of competence, including:

a) Maintaining competence within their role and field of practice.

b) Keeping knowledge and skills up-to-date to ensure safe and effective practice.

c) Understanding own development needs and make continuing improvements.

3. Students must know and be able to demonstrate their understanding of the need to uphold basic standards of good character, including:

a) Respect dignity, privacy and safety of individuals.

b) Ensuring actions are honest, trustworthy, reliable and dependable.

c) Ensuring services provided are delivered equally and inclusively.

d) Respecting the views, wishes and wellbeing of individuals.

Notes on boundaries and responsibilities (compulsory)

- The competencies listed above are only for use by those working with the general (healthy) population.
- A student successfully completing a certified course should be able to aid an individual in understanding how official guidelines are applied to them and their food preferences and signpost to reputable information sources, such as NHS Choices, recognised health charities, government advice and to suitably qualified medical and nutrition professionals. Completion of a certified course does not qualify an individual to provide prescribed, individualised or bespoke advice that goes outside of supporting achievement of official nutrition recommendations or in relation to an individual's medical condition(s).
- Individuals requesting/requiring prescribed, individualised or bespoke advice in relation to nutrition, dietary advice in relation to medical conditions, dietary advice or support with the primary aim of influencing sporting/fitness performance (i.e. for elite/professional individuals or groups) should be promptly referred on to a suitably qualified medical or nutrition professional (ANutr, RNutr, RD).

Guidance for training providers

Centre and qualification approval

Before you can begin delivery of this qualification, you must be a Y Awards Ltd centre with appropriate qualification and staff approval.

Find out more on our website:

ymcaawards.co.uk/approvals

Tutor, assessor and IQA requirements

All tutors, assessors and internal quality assurance (IQA) staff need to hold:

- a subject matter qualification
- a qualification related to the role that they will be performing (tutor, assessor or IQA).

Find out more on our website:

ymcaawards.co.uk/approvals/staff-approval

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Y Awards Ltd, has a long and respected history as the first UK awarding organisation to specialise in health and fitness qualifications, launching in 1998 as CYQ.

We are experts in education, health and wellbeing, with over 25 years' experience developing UK-regulated and globally recognised qualifications.

We work closely with industry experts, employers and training providers to make sure that our products and services deliver life-changing opportunities. With over half a million qualifications awarded, 400,000 people have advanced their career with Y Awards Ltd.

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