

Clinical Exercise Physiology Curriculum Framework Statement

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Foreword and Purpose

The Academy of Healthcare Science (AHCS) approve education programmes to ensure that they allow students to meet Standards of Proficiency and principles of Good Clinical Practice when they satisfactorily complete the programme. Standards of Proficiency are the threshold standards necessary for safe and effective practice. This document presents a curriculum framework for Clinical Exercise Physiology (CEP) Masters (MSc) degree courses which complements and expands upon the AHCS Standards of Proficiency and the Clinical Exercise Physiologist (CEP) Scope of Practice. It is a requirement of MSc CEP degree accreditation that University programmes demonstrate that all Standards of Proficiency are addressed in the course curriculum, through learning and assessment activities. This curriculum framework and the Standards of Proficiency and Scope of Practice documents should be read in conjunction, as collectively they form the basis of the formal requirements for AHCS MSc CEP degree course accreditation. All MSc courses wishing to go through the accreditation process will need to email AHCS directly, with a request to undergo the accreditation process. A pre-visit checklist is then completed and supporting evidence is required for the AHCS to begin the accreditation process.

What is a Clinical Exercise Physiologist?

A CEP is recognised by the AHCS as a Masters Level University qualified (or equivalent) health professional equipped with requisite knowledge, skills and competencies to work autonomously and as part of multi-disciplinary teams across health conditions outlined in the scope of practice. CEPs specialise in health and fitness screening and assessment, exercise prescription and delivery, and the implementation of behaviour change strategies for the prevention, treatment and management of health conditions. They are trained to screen and assess individuals across a spectrum of health and disease, and to use clinical and scientific reasoning to optimise the delivery of safe and effective exercise-based interventions. They are expected to advance their practice through continuing education, competency development and professional experience.

Scope of Practice: Health Conditions

The **health conditions** are included in the Scope of Practice, with examples. In the following curriculum framework, the term **condition** encompasses all categories of conditions currently included in the Scope of Practice: *cancer, cardiovascular, frailty, renal, mental health, metabolic, musculoskeletal, neurological and respiratory*. It is expected that MSc CEP courses include all of these conditions within course learning and assessment materials to some extent.

The Clinical Exercise Physiology Curriculum Framework

Pathophysiology and Clinical Management

Knowledge and skills:

- Knowledge of human anatomy and integrative systems physiology.
- Knowledge of the pathophysiological bases for all conditions in the scope of practice.
- Ability to identify risk factors, signs and symptoms, and common comorbidities and how pathology might impact on activity of daily living for all conditions.
- Knowledge of common diagnostic procedures and criteria for all conditions.
- Ability to explain the purpose, rationale, and clinical outcomes of typical therapeutic interventions for all conditions, including common surgical, medical (pharmacological and non-pharmacological) and allied health treatments.



- Ability to describe the impact of conditions on the physiological responses to common forms of exercise, including aerobic exercise, resistance exercise, flexibility and activities of daily living.
- Knowledge of, and ability to consider the effect of, surgical, medical and pharmacological treatments on exercise capacity and the physiological responses to exercise.
- Knowledge of, and ability to describe adaptations to exercise training, and how these are modulated by conditions and common treatments.

Screening and Risk Stratification

Knowledge and skills:

- Knowledge of relevant screening techniques and risk stratification processes.
- Ability to obtain relevant health information from a medical history, including social and cultural determinants of health.
- Ability to ascertain individual goals and aspirations, preferences, barriers, and facilitators in order to design interventions that optimise concordance and outcomes either to reduce the risk of relapse or identify social and psychological risks that can mitigate concordance to a healthy active lifestyle.
- Ability to identify contraindications and risks for exercise and activities of daily living
- for all conditions and to assess and stratify exercise-related risk using evidence-based tools.
- Ability to select and employ appropriate strategies and measurements to assess and manage clinical status before, during and after exercise.
- Ability to record, report, and appropriately respond to changes in risk factors and adverse signs and symptoms that may arise before, during, and after exercise.
- Ability to interpret information for the purpose of establishing clinical risk, including when needs are outside scope of practice.
- Ability to take appropriate action to refer to other health professionals (e.g. physiotherapist, dietitian, consultant).

Assessment of Health Status and Functional Capacity

Knowledge and skills:

- Knowledge of a broad range of evidence-based measurements (e.g. cardiorespiratory fitness, joint range of motion, spirometry, electrocardiogram) and patient reported outcome measures (e.g., rate of perceived exertion, dyspnoea, physical activity) for the assessment of clinical and functional status for all conditions.
- Ability to select and safely administer appropriate measurements to assess physiological function and health status.
- Ability to safely interpret assessments to establish a baseline or ongoing health status as part of the planning of exercise interventions.
- Ability to record and evaluate the results of assessments of clinical status and functional capacity and to communicate the outcomes and relevance to patients and other healthcare providers.
- Ability to assess individual goals, needs and objectives based on health and exercise history, motivation level and physical activity readiness.
- Ability to communicate appropriate support strategies to facilitate in-person and telehealth service delivery, which considers needs, preferences, health and digital literacy and accessibility factors.



- Ability to translate exercise assessment data into meaningful equivalents within activities of daily living (e.g. in the workplace, home or recreational activities).

Design of Exercise Interventions

Knowledge and Skills

- Knowledge and ability to explain optimal modes, frequencies, intensities, durations and volumes of acute and chronic exercise for all conditions, based on scientific evidence.
- Ability to design evidence-based exercise plans that are safe, effective and consider treatment goals.
- Ability to consider environmental, medical history, clinical status and physiological assessment information and take psychological, social and cultural needs into consideration.
- Ability to recognise the risks and benefits of exercise training for all conditions including aerobic, resistance, balance and flexibility exercise training.
- Knowledge of and ability to design appropriate regressions and progressions for individual exercises and/or adapt an exercise where necessary for specific conditions.
- Knowledge of best practice and condition specific exercise and nutrition guidance and resources based on available scientific evidence.
- Knowledge and ability of how to incorporate other activities of daily living into the overall weekly dose of physical activity including breaking up sedentary behaviour.

Exercise Delivery and Implementation

Knowledge and skills:

- Ability to deliver safe and effective exercise sessions, adapted for individual and exercise environment needs (e.g. home, virtual, workplace etc).
- Ability to lead individuals with single or multiple conditions and comorbidities in exercise programmes.
- Knowledge of, and ability to evaluate, contraindications to exercise and associated risks/benefits including the ability to modify or cease the exercise program where necessary.
- Ability to identify and monitor adverse signs and symptoms during an exercise session and recovery, and take appropriate action where necessary.
- Ability to monitor and evaluate the outcomes of exercise interventions.

Behaviour Change and Communication

Knowledge and skills:

- Knowledge of barriers and motivators to exercise (e.g. capability, opportunity, motivation) and of living with health conditions (e.g. pain, anxiety, depression, bereavement), including influence of wider socio-cultural factors (e.g., ethnicity, gender, deprivation).
- Knowledge of the evidenced based biological, psychological, social mechanisms through which exercise impacts mental health and wellbeing.
- Ability to promote a healthy relationship with exercise and understand how to recognise, support and signpost in case of concerns (e.g., compulsive exercise).
- Ability to understand contemporary evidenced based theories of behaviour change (e.g. Self-Determination Theory, Social Cognitive Theory, Affective-Reflective Theory) and implement these to inform approaches to support behaviour change.



- Ability to apply basic evidence-based, client-centred, exercise counselling/coaching skills to understand goals, confidence, motivation, thereby effectively promoting exercise initiation and adherence (e.g., motivational interviewing).
- Knowledge of behaviour change technique taxonomies and ability to select and apply evidence-based techniques in practice to promote self-regulation of long-term exercise behaviour (e.g., barrier identification, action planning, self-monitoring).
- Ability to consistently engage in reflective practice with the understanding of and use of reflective models.
- Ability to co-produce with the client/patient meaningful longer-term goals, beyond the weeks of focused/structured exercise, that lead to an enhanced quality of life, which includes sustainable levels of health related physical activity (e.g. at home, workplace, part of transport etc).

Entry Requirements

The usual entry requirements for the courses are an undergraduate degree in a sport and exercise-science (or related area), with a minimum 2.1 degree classification. Students on all courses will be required to have enhanced disclosure and barring service (DBS) check, and occupational health clearance. Education providers must ensure appropriate entry level qualifications. IELTS requirements for international students applying to UK Higher Education Institutions to study a programme leading to eligibility to register are set at an overall score of 6.5 with no element below 6.5 for reading and writing and 6.0 for speaking and listening for post graduate students.

Practice-based learning

A minimum of 250 hours of practice-based learning, of which at least 140 hours should take place in a clinical setting. This should include pathophysiology and clinical management, screening and risk stratification, assessment of health status and functional capacity, design of exercise interventions, exercise delivery and implementation prescription and behaviour change for individuals with health conditions outlined in scope of practice. Up to 110 hours of this experience can be course-based practical activities or simulated experience on healthy individuals. All hours must be logged in the CEP practice based log-book (Appendix B). Practical experience outside of the above components cannot be used towards CEP practice-based learning. In addition:

- The practice-based learning component of the course must be a discrete and well organised programme that provides students and clinical supervisors with the support necessary to achieve a high-quality experience. There must be specific learning outcomes for students to achieve coupled with appropriate assessment. The university programme teams must take ownership of ensuring that students have an appropriate level of knowledge and skill before they enter the clinical setting. Whilst shadowing can count towards clinical experience this should progress to performing the role under supervision. Supervisors of students' practice-based learning experience should not be solely responsible for ensuring that students have the necessary knowledge and skill base to meet AHCS Standards of Proficiency. Practice-based learning activities should be organised by the University for the students — the students should not be solely responsible for organising their practice-based learning activities.



- Where possible, some of the experiences should be external to the university. It is expected that at least 140 hours should be in a clinical setting i.e. interacting with individuals with health conditions outlined within the CEP scope of practice. Some universities may also have their own clinic or community-oriented experiences, which may complement the external experiences. Taught modules that are required to be completed at the same time as the practice-based learning experiences should be structured in a manner to engage students in a high-quality experience, including simulation, to prepare them for clinical practice-based learning.

In ensuring that practice-based learning reflects the CEP scope of practice, practice-based learning should include a mix of in-person or remote delivery i.e. telehealth or virtual¹ exercise service delivery, whilst ensuring appropriate compliance with GDPR guidance as governed by the setting, observation of expert practitioners and a combination of other activities designed to support the delivery of exercise services.

- Administrative work is important for practitioners and can be included as a small component of clinical practice-based learning.

Any remaining hours may be completed as health-related activities, possibly without a related exercise intervention:

- Provision of further exercise delivery
- Diagnostic investigations or procedures
- Health Checks (e.g. point of care testing)
- Case management
- Health promotion, health education or workplace health programmes.

Learning, Teaching and Assessment

Assessment within and across modules should be appropriately varied but comprehensive, reflect best practice, be criterion based, be explicitly matched with the learning objectives of the modules and clearly contribute to the proposed learning objectives of the course. Assessments should be designed so that students will graduate from the course appropriately skilled and knowledgeable as per the CEP scope of practice and standards of proficiency such as: objective structured clinical examinations; case studies; reflective practice; written exams; research reviews; viva-voce; professional practice observations; portfolio assessments such be considered. It is also recommended that each student completes a case study (or similar) assessment on an individual patient that includes all aspects of the curriculum (pathophysiology and clinical management, screening and risk

¹ Delivery of exercise services may incorporate practicum activities that are supervised via internet or telephone based video conferencing (e.g. web streaming, e-health conferencing). In these instances, it is expected that the student will conduct the face-to-face delivery of services with a patient while being overseen by a supervisor via real-time video conferencing. The video conferencing technology must incorporate real-time video and audio streaming, and must allow for unimpeded communication between the student and supervisor. Where video supervision is used, due consideration should be given to the safety of the patient, and appropriate risk mitigation planning should be undertaken in advance by the supervisor. Video supervision is likely to be inappropriate for use with high-risk patients. It would not be appropriate for a student to complete all their clinical practicum hours under video supervision, and students are therefore encouraged to undertake some of their clinical practicum hours under direct supervision.



stratification, assessment of health status and functional capacity, design of exercise interventions, exercise delivery and implementation prescription and behaviour change). Moreover, each course must embed the CEP Clinical Assessment of Competencies (CEP-CAP) (APPENDIX A) within the learning and assessment of the MSc modules and/or the practice-based learning component of the course.

N.B. Each student must (i) complete the CEP practice-based log-book outlining the required practice-based hours during the degree course (Appendix A) and (ii) pass the 3 individual CEP-CAP (Appendix B). Both documents require appropriate sign off (ideally from an AHCS registered CEP who is part of the University programme team or placement supervisor) to be eligible for AHCS graduate registration.

The following academics, practitioners and health professionals (Table 1) contributed to and approved this CEP curriculum framework. An external consultation was also performed in Feb 2022, the results and feedback of the consultation can be viewed at www.clinicalexercisephysiology.org.uk.

Table 1. List of academics, practitioners and health professionals who have contributed to this curriculum framework.

Prof Helen Jones , Liverpool John Moores University	Winthrop Prof Daniel Green , The University of Western Australia
Prof Greg Whyte , Liverpool John Moores University, <i>Board Member UK Active</i>	Assoc Prof Chris Askew University of Sunshine Coast
Dr Keith Tolfrey , Loughborough University, <i>Director International Confederation for Sport and Exercise Science Practice (ICSESP)</i>	Dr Andrew Scott , University of Portsmouth, <i>Chair, British Association of Sport and Exercise Sciences (BASES) Clinical Exercise Science and Practice Interest Group at time of writing</i>
Prof Anna Campbell , Edinburgh Napier University, <i>Director CanRehab</i>	Prof Keith George , Liverpool John Moores University
Prof John Buckley , Keele University, WHO Ischaemic Heart Disease and Rehabilitation 2030 Working Group Member	Prof Dawn Skelton , Glasgow Caledonian University, <i>Director Later life Training, Co-Chair British Geriatrics Society Rehabilitation Group</i>
Prof Sandy Jack , University of Southampton and Honorary Consultant Clinician Scientist University Hospital Southampton NHS Foundation Trust.	Dr Gordon McGregor , University Hospitals Coventry and Warwickshire NHS Trust and Coventry University
Dr Alasdair O’Doherty , Northumbria University	Prof David Broom , Coventry University, <i>BASES board member and Division of Physical Activity for Health, Chair at time of writing</i>
Dr Eddie Caldow , University of Salford	Dr Amanda Pitkethly , Edinburgh Napier University
Dr Gemma Miller , Liverpool John Moores University	Dr Lisa Board , University of Sunderland
Prof Nefyn Williams , University of Liverpool, Professor in Primary Care	Dr Louise Naylor , The University of Western Australia
Dr Paula Watson , Liverpool John Moores University	Anthony Crozier , Liverpool John Moores University

*Minor changes to this curriculum framework may occur on a yearly basis, any such changes will be outlined to University degree courses. A formal review of this curriculum framework will begin in 2025 including the practical based learning requirements and hours.

Appendix A

CEP Clinical Assessment of Competencies (CEP-CAP)



To ensure patient safety it is the responsibility of accredited programmes to ensure that students are assessed the three CEP-CAP's. Each student is required to meet expectations for each component. There can be more than one attempt to pass each CEP-CAP but failure to pass each CEP-CAP will preclude the student from being eligible to be a graduate AHCS registrant.

1. Professional Practice Assessment Criteria

STUDENT NAME OR ID			
MODULE			
ASSESSOR NAME			
ASSESSOR TITLE/POSITION			
BRIEF DESCRIPTION OF ASSESSMENT AND FOCUS OF SCENARIO e.g. What health condition/co-morbidities does the patient have? What is the student expected to achieve?			
Please grade the student in the following areas:	Below Expectation	Meets Expectation	Above Expectation
History taking Does the student obtain the correct information prior to undertaking a procedure from the patient or a clinical colleague (checking identity, medications/history)?			

<p>Communication skills</p> <p>Does the student have appropriate communication skills when meeting and greeting the patient/client? Do they use language appropriate to the situation (verbal and/or body language) when explaining or discussing aspects of clinical care? Do they check the understanding of the patient/client or clinical colleague?</p>			
<p>Patient Assessment Skill</p> <p>Does the student perform the assessment/measurement (e.g. CPET, manual blood pressure, 6-minute walk test) correctly?</p>			
<p>Assessment Interpretation</p> <p>Was the assessment/measurement method appropriate for the intended outcome? Can they discuss the quality control measures to ensure the result is accurate (ensure correct calibration or verification, where required)?</p>			
<p>Assessment Feedback</p> <p>Can the student record and evaluate the results of assessments/measurements and communicate the outcomes and relevance to patients and other healthcare providers?</p>			
<p>Professionalism</p> <p>The student was dressed appropriately and the conduct of the consultation would be deemed professional.</p>			

Did the student introduce themselves and their role and/or did they discuss the information with a colleague using appropriate language, considering any patient confidentiality or ethical issues?			
Organisation and efficiency Was the student well organised and efficient, ensuring all record keeping was appropriate and accurate; did they keep to time and ensure accurate recording of information?			
Overall clinical care Did the student show respect, empathy and compassion for the patient and/or recognise the importance of the procedure/test/assessment within the care pathway?			

Assessment outcome	Pass	Fail
Feedback		
Date of assessment		
Signed (assessor)		

2. Practical/Procedural Skill Assessment Criteria

STUDENT NAME OR ID			
MODULE			
ASSESSOR NAME			
ASSESSOR TITLE/POSITION			
BRIEF DESCRIPTION OF ASSESSMENT AND FOCUS OF SCENARIO e.g. What practical skill or procedure is the student being assessed on (e.g. CEPT, 6 min walk, ECG placement)? What health condition/co-morbidities does the patient have?			
Please grade the student in the following areas:	Below Expectation	Meets Expectation	Above Expectation
Understands scientific principles of practical skill or procedure, including basic science underpinning it			
Has read, understands, and follows the appropriate guidance and standard operating procedures, risk assessments (COSHH if applicable), and any other relevant health and safety documentation			

Understands and applies the appropriate internal and external quality control associated with the procedure (e.g. calibration and verification of equipment)			
Understands the risks associated with items of equipment and uses them appropriately			
Completes associated documentation accurately			
Output meets accepted laboratory/professional standards			
Carries out the procedure within the appropriate time frame			
Can identify limitations of the test			
Demonstrates awareness of the limits of responsibility and when to seek advice			

Assessment outcome	Pass	Fail
Feedback		
Date of assessment		
Signed (assessor)		

3. Exercise Prescription and Delivery Assessment Criteria

STUDENT NAME OR ID			
MODULE			
ASSESSOR NAME			
ASSESSOR TITLE/POSITION			
BRIEF DESCRIPTION OF ASSESSMENT AND FOCUS OF SCENARIO e.g. What exercise prescription is the student expected to devise (e.g. group or individual)? What health condition/co-morbidities does the patient(s) have?			
Please grade the student in the following areas:	Below Expectation	Meets Expectation	Above Expectation
Contraindications to exercise Can the student identify the contraindications to exercise for this patient/client(s) based on medical history, clinical status, physiological assessment information?			

<p>Exercise prescription</p> <ol style="list-style-type: none"> 1. Can the student devise an appropriate, safe and effective exercise prescription for the patient/client(s) (groups or individuals)? 2. Are they able to identify the risks and benefits of distinct forms of exercise (aerobic, resistance, balance and flexibility)? 3. Can the student design appropriate regressions, adaptations, and progressions for the patients/clients? 			
<p>Types of exercise</p> <p>Can the student choose and explain the optimal mode, frequency, intensities, durations and volumes of exercise for the patient/client(s)?</p>			
<p>Exercise Delivery</p> <ol style="list-style-type: none"> 1. Can the student deliver appropriate and safe exercises for the patient/client(s) (group or individual)? 2. Are they able to demonstrate and provide safe and effective instructions for exercise? 3. Can the student identify adverse signs and symptoms and modify or cease the session/ program where appropriate? 			
<p>Behaviour Change</p>			

Can the student identify patient/client(s) barriers and facilitators to exercise?			
Can the student select and apply evidence-based techniques in practice to promote self-regulation of long-term exercise behaviour			

Assessment outcome	Pass	Fail
Feedback		
Date of assessment		
Signed (assessor)		

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Appendix B

Clinical Exercise Physiology Practice-Based Logbook

Name:				
SCREENING AND RISK STRATIFICATION				
<ol style="list-style-type: none"> 1. Assessing and stratifying exercise related risk using evidence-based tools. 2. Obtaining relevant health information and medical history 3. Strategies and measurements used to assess and manage health status 4. Methods used to record and report changing risk factors and adverse signs and symptoms. 				
DATE	No. HRS	MODULE	CLIENT OR PATIENT(S) DESCRIPTION (HEALTHY/CLINICAL*)	DESCRIPTION (PART of MODULE LAB/ PRACTICE/ SIMULATION/ ASSESSMENT)
			*Whilst a client/patient may have co-morbidities, the primary condition must be noted.	

ASSESSMENT OF HEALTH STATUS AND FUNCTIONAL CAPACITY				
<ol style="list-style-type: none"> 1. Performing appropriate assessments (e.g. functional capacity, patient reported outcomes) 2. Evaluating capacity to perform exercise 3. Reporting clinical status 				
DATE	No. HRS	MODULE	CLIENT OR PATIENT(S) DESCRIPTION (HEALTHY/CLINICAL*)	DESCRIPTION (PRACTICE/SIMULATION/ASSESSMENT)
			*Whilst a client/patient may have co-morbidities, the primary condition must be noted.	
DESIGN OF EXERCISE INTERVENTIONS				
<ol style="list-style-type: none"> 1. Designing safe and effective exercise plans 2. Utilising optimal modes, frequencies, intensities, durations and volumes of exercise 3. Recognising the risks and benefits of different forms of exercise training 				

4. Designing appropriate regressions, adaptations and progressions

DATE	No. HRS	MODULE	CLIENT OR PATIENT(S) DESCRIPTION (HEALTHY/CLINICAL*) *Whilst a client/patient may have co-morbidities, the primary condition must be noted.	DESCRIPTION (PRACTICE/SIMULATION/ASSESSMENT)

EXERCISE DELIVERY AND IMPLEMENTATION

1. Delivering safe and effective exercise sessions, adapted for individual and exercise environment needs
2. Monitoring and identifying adverse signs and symptoms during exercise sessions and recovery

DATE	No. HRS	MODULE	CLIENT OR PATIENT(S) DESCRIPTION (HEALTHY/CLINICAL*) *Whilst a client/patient may have co-morbidities, the primary condition must be noted.	DESCRIPTION (PRACTICE/SIMULATION/ASSESSMENT)

BEHAVIOUR CHANGE AND COMMUNICATION				
<ol style="list-style-type: none"> 1. Supporting learning to self-regulate physical activity behaviour and planning for long-term physical activity maintenance 2. Recognising barriers and motivators to exercise and factors that affect long-term exercise adherence and compliance 3. Utilising lifestyle strategies, programmes, and resources, including government and community-based population-wide strategies pertinent to supporting physical activity behaviour change 				
DATE	No. HRS	MODULE	CLIENT OR PATIENT(S) DESCRIPTION (HEALTHY/CLINICAL*)	DESCRIPTION (PRACTICE/SIMULATION/ASSESSMENT)
			*Whilst a client/patient may have co-morbidities, the primary condition must be noted.	

Logbook outcome	Pass	Fail
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Further Feedback	
Date	
Signed* * Signatory must be an AHCS registered CEP who is part of the University programme team or placement supervisor	

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