

Cell and Gene Therapy Course Descriptor

Course Title	Cell and Gene Therapy	Faculty	EDGE Innovation Unit (London)
Course code	NCHNAP5107	Course Leader	Professor Scott Wildman (interim)
Credit points	15	Teaching Period	This course will typically be delivered over a 6-week period.
FHEQ level	5	Date approved	Sep 2021
Compulsory/ Optional	Compulsory	Date modified	
Pre-requisites	None		
Co-requisites	None		

Course Summary

This course introduces and explores the principles, theory and concepts that underpin cell and gene therapy. This rapidly advancing area in bioscience is recognised as having the potential to revolutionise therapy for inherited disorders and many other diseases. The course starts by examining the implications of the human genome project and reviews the function of DNA, chromosomes, RNA transcription and translation. It then considers the significance of Recombinant DNA techniques, and the use of mRNA and vector design in effective gene therapy. The course also considers the impact of cell therapy and the characteristics and significance of stem cells and the issues and challenges faced in transplantation and integration, alongside ethical and regulatory concerns.

Course Aims

- To provide learners with the principles, theory and concepts that define and distinguish cell and gene therapy and the wider scientific and cultural

contexts in which they are being developed, applied and the associated ethical and regulatory issues.

- To provide learners with detailed insight into the challenges and potential of cell and gene therapy to address inherited disorders and disease.
- Train learners to engage systematically with the methodologies, techniques, tools and processes that enable cell and gene therapy.

Learning Outcomes

On successful completion of the course, learners will be able to:

Knowledge and Understanding

- K1b Knowledge and critical understanding of the principles of cell and gene therapy and the contexts in which they are applied.
- K2b Knowledge and critical understanding of the methodologies, techniques, tools and processes employed in cell and gene therapy.
- K4b Demonstrate knowledge and critical understanding of the challenges and potential of cell and gene therapies to address inherited conditions and disease.

Subject Specific Skills

- S2b Critically evaluate scientific experimentation approaches used in cell and gene therapy and use creative thinking to challenge assumptions.
- S3b Work with minimum supervision to research and critically evaluate the ethical, cultural and regulatory issues that arise from advances in cell and gene therapy.
- S4b Critically analyse how cell and gene therapy can improve processes and meet scientific objectives.

Transferable and Professional Skills

- T1b Take responsibility for independent study and time management.
- T2b Conceptually understand how to conduct basic scientific experiments to test ideas, solve problems and evidence theory.
- T3bi Communicate clear arguments and critical analysis to specialist and non-specialist audiences.
- T3bii Demonstrate a sound technical proficiency in written English and skill in selecting vocabulary so as to communicate effectively to specialist and non-specialist audiences.

Teaching and Learning

This is an e-learning course, taught throughout the year.

This course can be offered as a standalone short course.

Teaching and learning strategies for this course will include:

- Online learning
- Online discussion groups
- Online assessment

Course information and supplementary materials will be available on the University's Virtual Learning Environment (VLE).

Learners are required to attend and participate in all the formal and timetabled sessions for this course. Learners are also expected to manage their self-directed learning and independent study in support of the course.

The course learning and teaching hours will be structured as follows:

- Off-the-job learning and teaching (6 days x 7 hours) = 42 hours
- One-the-job learning (12 days x 7 hours) = 84 hours (e.g. 2 days per week for 6 weeks)
- Private study (4 hours per week) = 24 hours

Total = 150 hours

Workplace assignments (see below) will be completed as part of on-the-job learning.

Assessment

Formative

Learners will be formatively assessed during the course by means of set assignments. These will not count towards the final degree but will provide learners with developmental feedback.

Summative

Assessment will be in two forms:

AE	Assessment Type	Weighting	Online submission	Duration	Length
1	Portfolio (workplace exercises)	50%	Yes	Requiring on average 20 – 25 hours to complete	-
2	Set Exercises (problem-solving)	50%	Yes	Requiring on average 20 – 25 hours to complete	-

Feedback

Learners will receive formal feedback in a variety of ways: written (via email or VLE correspondence) and indirectly through online discussion groups. Learners will also attend a formal meeting with their Academic Mentor (and for apprentices, including their Line Manager). These bi or tri-partite reviews will monitor and evaluate the learner's progress.

Feedback is provided on summatively assessed assignments and through generic internal examiners' reports, both of which are posted on the VLE.

Indicative Reading

Note: Comprehensive and current reading lists for courses are produced annually in the Course Syllabus or other documentation provided to learners; the indicative reading list provided below is used as part of the approval/modification process only.

Books

- Watson, J. D. (1965). *Molecular biology of the gene*. New York : W. A. Benjamin.
- Vertès, A., Dowden, N. J., Smith, D. and Qureshi, N. (2020). *Second Generation Cell and Gene-based Therapies : Biological Advances, Clinical Outcomes and Strategies for Capitalisation*. London ; San Diego, CA : Academic Press
- Turnpenny, P. D., Ellard, Sian, & Cleaver, Ruth. (2021). *Emery's Elements of Medical Genetics and Genomics* (Sixteenth edition.). Philadelphia, PA : Elsevier 2021

Journals

Learners are encouraged to read material from relevant journals on cell and gene therapy as directed by their course leader.

Electronic Resources

Learners are encouraged to consult relevant websites on cell and gene therapy.

Indicative Topics

- Cell structure and function
- Modern and experimental therapeutics
- Disease

Version History

Title: NCHNAP5107 Cell and Gene Therapy Course Descriptor					
Approved by: Academic Board					
Location: Academic Handbook/Programme specifications and Handbooks/ Undergraduate Apprenticeship Programmes/BSc (Hons) Bioscience with Digital Technologies Programme Specification/Course Descriptors					
Version number	Date approved	Date published	Owner	Proposed next review date	Modification (As per AQF4) & category number
3.0	October 2022	January 2023	Scott Wildman	September 2026	Category 1: Corrections/clarifications to documents which do not change approved content. Category 3: Changes to Learning Outcomes
2.1	May 2022	May 2022	Scott Wildman	September 2026	Category 1: Corrections/clarifications to documents which do not change approved content.
2.0	January 2022	April 2022	Scott Wildman	September 2026	Category 3: Changes to Learning Outcomes
1.0	September 2021	September 2021	Scott Wildman	September 2026	