

Course size (nominal values; actual values may depend on programme)

Credits 5.0 Study time 135 h Contact hrs 60.0 h

Course offerings and teaching methods in academic year 2018-2019

A (semester 2)	Dutch	lecture	30.0 h
		group work	0.0 h
		practicum	30.0 h
		demonstration	0.0 h

Lecturers in academic year 2018-2019

Vanrompay, Daisy	LA22	lecturer-in-charge
van der Meulen, Karen	LA22	co-lecturer

Offered in the following programmes in 2018-2019

	crdts	offering
Master of Science in Bioscience Engineering: Cell and Gene Biotechnology	5	A

Teaching languages

Dutch

Keywords

Human and animal cell and tissue culture, gene transfer and gene expression in eukaryotic cells and biomedical applications, biosafety

Position of the course

Human and animal biotechnology, biomedical applications of gene transfer en gene expression in eukaryotic cells, biosafety

Contents

Part on human and animal cell and tissue engineering: cell biology in vitro, cell culture laboratory, aseptic techniques, sterilizations, systems for cell and tissue engineering, culture media, systems for mass production of cells, primary cell cultures, cell lines, characterization of cells and transformation of cells, cryoprotection, contamination, cloning, embryology, stem cell research, recombinant drug design and their registration engineering of DNA and RNA vaccines, gene therapy, bioethics.

Part on biosafety: biological hazards, human factors leading to intentional and non-intentional errors, occupational health and biosafety, international and national legislation, containment principles, BSL3, biorisk assessment and management, environmental safety, facility (re)-design, equipment, good microbiological practice (GMT), standard operation procedures (SOPs), personal protective equipment, infection control, biological waste management, emergency procedures, incidents and accidents investigation, monitoring and control and auditing, transport, import and export of biological agents, field experiments, bioethics.

Initial competences

General knowledge on gene technology, cell biology, microbiology

Final competences

- 1 Knowledge on the manipulation of human and animal cells and tissues.
- 2 Knowledge on recombinant drug engineering and their applications
- 3 Knowledge on BSL2 and BSL3 activities. Competence to become a professional biosafety coordinator

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Demonstration, group work, lecture, practicum, seminar

Extra information on the teaching methods

Demonstration: cell culture, tissue culture, biosafety level 2 and BSL3 laboratories

Group work: internal biosafety audit at UGent and preparing a written report on the audit- presentation of the results and advices.

Lecture: theory on biosafety (part 1 of the course) and theory on human and animal cell and tissue culture engineering and applications (part 2 of the course) with power point presentations which will be made available using Minerva, Video's.

Master's dissertation: possibility to prepare a Master's dissertation

Practical: cell and tissue engineering techniques (lab work), group work (PC class practical and presentation of the results of the internal biosafety audit)

Learning materials and price

Syllabus (Dutch and part of it in English). Estimated price 15 euro.

References

- 1) Culture of Animal cells. A manual of basic techniques and special applications. 6th edition. 2010. R.I. Freshney. Wiley-Blackwell, J. Wiley and Sons Inc., Hoboken, New Jersey, US.
- 2) Animal Cell culture; essential methods; Wiley-Blackwell, 2011. J.M. Davis, J. Wiley and Sons Inc., Hoboken, New Jersey, US.
- 3) Human stem cell technology and biology. 2011. G. Stein, M. Borowski, M.X. Luong. Wiley-Blackwell, J. Wiley and Sons Inc., Hoboken, New Jersey, US.
- 4) Breyer D, De Schrijver A, Goossens M, Pauwels K, Herman P. (2011). Biosafety of molecular farming in genetically modified plants. In Wang, Aiming; Ma, Shengwu (Eds.), Molecular Farming in Plants: Recent Advances and Future Prospects, Springer, ISBN 978-94-007-2216-3
- 5) Biological Safety: principles and practices Diana O Fleming (2006), ASM Press Bioethics and Biosafety. (2008). M.K. Sateesh. I.K. International Publishing House, New Delhi, India

Course content-related study coaching

Teachers available for student counseling

Evaluation methods

end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period

Written examination with open questions, written examination, participation, assignment

Examination methods in case of periodic evaluation during the second examination period

Written examination with open questions, written examination, participation, assignment

Examination methods in case of permanent evaluation

Report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Extra information on the examination methods

Theory: written examination

Practical course: written report on the practical laboratory courses, permanent evaluation and assignment (ppt presentation) on the internal biosafety audit

Calculation of the examination mark

Lectures: 15/20

Exercises (practical, group work): 5/20

Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.