

SEMESTER I, II and IV
LSM1302/GEK1527 – GENES AND SOCIETY

Preclusion: BL1361. Not for students taking Life Sciences major/minor, FST, Pharmacy and Bioengineering major.
Workload: 26 lecture hours + 24 hours of Tutorials, Interactive Learning & Feedback for CAs (CD-ROM-assisted Learning, Web-based Interactive Learning, Assignments, Quizzes, etc.)

The aim of the module is to introduce students to the modern concepts in biology and to enable them to evaluate independently the potential benefits and risks of the biotechnological revolution and its implications for society. It focuses on how genes and our understanding of it had impacted, are and will be impacting, our lives as individuals and our society at large. While the module covers broad themes of genetics and biotechnology including related ethical issues and implications, it also provides sufficient grounding of fundamental concepts to ensure students of diverse background can appreciate the significance of past, present and future developments of genetic knowledge on societies.

S/N	Topics	Lecture hours
1.	<p>Introduction: Historical and the Fundamentals</p> <p>An overview of how our understanding of genes have developed and changed over time, moving on from classical genetics (traits and inheritance) to laying down basic modern molecular biology concepts such as DNA structure, replication, transcription, translation, mutation to regulation and organization of genetic materials in different organisms.</p>	10
2.	<p>Tools in Genetic Engineering: From Laboratory to Society</p> <p>Principle description of how several essential techniques (e.g. nucleic acid detection, amplification, sequencing, cloning, gene transfer) are developed based on concepts laid in part (1) above and subsequently used for various real-world applications (e.g. forensic science, archaeology, health-care, drug discovery and even in art).</p>	6
3.	<p>Genetic Engineering Applications in Society: Microorganisms, Plants, Animals and Humans</p> <p>Specific real-world examples of genetic engineering applications in different organisms (microbes, plants, animals and humans) together with their benefits (e.g. increase quality/quantity food production, new energy resources, better health-care) and potential harms (e.g. ecological and biodiversity impact, bio-terrorism) are highlighted.</p>	8
4.	<p>Ethical, Legal and Social Implications</p> <p>Ethical, legal and social implications of biotechnology applications in society are discussed with hypothetical and real-world examples to give students a better appreciation of the complexity and the diverse societal response to current and potential issues.</p>	2
Total Lectures: 26h		
Tutorials, Interactive Learning & Feedback for Continuous Assessments: 24h (CD-ROM-assisted Learning, Web-based Interactive Learning, Quizzes, Assignments, etc.)		
Total hours:		50h

References

1. William J. Thieman and Michael A. Palladino. Introduction to Biotechnology. Pearson Benjamin Cummings, San Francisco.

2. Relevant state-of-the-art articles in popular press (e.g. Time, Newsweek) and popular scientific journals (e.g. Scientific American, New Scientist), as will be listed on the course website or provided during the lectures.

Mode of Assessment

Continual Assessment (assignments, short structured questions, essay, quizzes, etc.): 40%

Closed-Book Final Examination (Multiple Choice Questions): 60%

MODULE CO-ORDINATORS:

Dr. Lam Siew Hong (Semester I and IV) (Tel: 6516-7379, E-mail: dbslsh@nus.edu.sg)
Dr Lin Qingsong (Semester II) (Tel: 6516-7769, E-mail: dbslinqs@nus.edu.sg)

LECTURERS:

Dr. Lam Siew Hong (Semester I and IV) (Tel: 6516-7379, E-mail: dbslsh@nus.edu.sg)
Dr Lin Qingsong (Semester II) (Tel: 6516-7769, E-mail: dbslinqs@nus.edu.sg)
Assoc. Prof. Yasuhiro Sawada (Semester II) (Tel: 6516-7067, E-mail: dbssy@nus.edu.sg)
Assoc. Prof. Hong Yunhan (Semester II) (Tel: 6516-2915, E-mail: dbshyh@nus.edu.sg)