



SYLLABUS

Course Code	Course Num.	Course Name	Credit Hours	Lec.	Lab.	Tut.	Private study	Pre-requisites	Course Level	Teaching Language
BIO	436	Human and Genetic Engineering	3	2	2	0	3-5	BIO 333	7	English

A. Course Description

The course is designed to introduce methods and applications of genetic engineering, including gene manipulation and transfer techniques in prokaryotes and eukaryotes. Emphasis on applications of recombinant DNA technology in the elucidation of gene function. Consideration of recent technological developments in molecular genetics, such as cloning, gene therapy, the patenting and release of genetically engineered organisms, and societal issues related to these developments.

B. Course Outcomes

At the end of this course the student will be able:

1. To gain an understanding of basic principles and new advances in genetics.
2. To gain appreciation of how genetics can impact humans.
3. To evaluate the risks and benefits of different applications of genetic Knowledge.

C. References:

Required Textbook

- *Desmond S. T. Nicholl, an Introduction to Genetic Engineering, Cambridge University Press, (2008). Recombinant DNA (Paperback), ISBN-13: 978-0521615211.*
- *Stefan Surzycki Human Molecular Biology Laboratory Manual 1st Edition. (2003). ISBN-13: 978-0632046768.*

Other references:

- *Rasko C.S. Downes, Genes in Medicine: Molecular biology and human genetic disorders, Publisher: Springer; 1st edition (1994) ISBN-10: 0412373408.*

Course Website: Google Classroom Webpage: <http://www.imamm.org/>

D. Topics Outline

D1. Lectures topics

1. Formal Analysis of the Transmission of Genes from Generation to Generation.

Mendelian Inheritance and the Role of Chromosomes; Population Genetics; Quantitative Inheritance.

2. The Nature of Genes.

Definition of Genes: Mutation, Open Reading Frames, Complementation, Activities of Gene Products. Location of Genes: Recombination Mapping, Restriction Mapping.



3. Manipulation of Genes.

Natural Genetic Engineering; Lysogeny; Transposition; Genetic Engineering by Human Intervention; Gene Therapy.

4. Molecular Mechanisms of Genetic Processes.

*Regulation of Gene Action.
DNA Replication.*

5. Human Genetics.

6. Genetic Disease.

7. Speculations on Genetic Engineering, Eugenics, and Human Evolution

8. Methods and issues relating to micro-organisms a genetic engineered.

9. Methods and topics related to genetic engineered plants.

10. Organisms of Genetic engineering techniques (cloning).

11. Applications for engineer genetic beings.

D2. Laboratories topics

1. *Cytology preparations for human chromosomes.*
2. *Study of packages on human chromosomes.*
3. *Chromosomal abnormalities (quantitative and structural) in Human.*
4. *Genes cloning.*
5. *Library of DNA.*
6. *Extraordinary Measures.*
7. *Identify and know the sequences.*
8. *Gene transfer.*
9. *Human genome sequence databases.*
10. *General revision.*

E. Office Hours

Office hours give students the opportunity to ask in-depth questions and to explore points of confusion or interest that cannot be fully addressed in class.

F. Exams & Grading System

The semi-official dates of the exams for this course are:

- **Midterm 1:** 6th or 7th week.
- **Midterm 2:** 11th or 12th week.
- **Quizzes & Homeworks:** During the semester.
- **Final lab. Exam :** 14th or 15th week.
- **Final Exam** : 16th week.



Your course grade will be based on your semester work as follows:

Midterm 1: 15 %	Midterm 2: 15 %	Final lab. Exam: 20%	Final Exam: 40 %
Quizzes, Homework, Attendance & Participation: 10 %			

The grading distribution:

A+	A	B+	B	C+	C	D+	D	F
[95, 100]	[90, 95]	[85, 90]	[80, 85]	[75, 80]	[70, 75]	[65, 70]	[60, 65]	[0, 60]

G. Student Attendance/Absence

Only three situations will be considered as possible excused absences:

- Occurrence of a birth or death in the immediate family will be excused. ("Immediate family" is defined by the University as spouse, grandparents, parents, brother, or sister).
- Severe illness in which a student is under the care of a doctor and physically unable to attend class will be excused. Students are not excused for a doctor's appointment. Do not make appointments that conflict with rehearsals. Notes from the University Health Center will be accepted.

[Executive Rules for Study Regulations and Exams](#)

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