

## *The Hebrew University of Jerusalem*

### *Syllabus*

## **MOLECULAR BIOLOGY OF ANIMAL CELLS - 72651**

*Last update 05-08-2019*

*HU Credits:* 2

*Degree/Cycle:* 1st degree (Bachelor)

*Responsible Department:* Life Sciences

*Academic year:* 0

*Semester:* 2nd Semester

*Teaching Languages:* Hebrew

*Campus:* E. Safra

*Course/Module Coordinator:* Prof Nayef Jarrous

*Coordinator Email:* [jarrous@md.huji.ac.il](mailto:jarrous@md.huji.ac.il)

*Coordinator Office Hours:* By appointment

*Teaching Staff:*

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Prof Nayef Jarrous

Course/Module description:

The course is intended for undergraduate students in life and medical sciences. It focuses on molecular genetics/biology of transcription, processing of RNA and protein translation in animal cells. An emphasis will be placed on small molecules of RNA and their roles in regulation of the aforementioned biological processes.

Course/Module aims:

Formation of strong background for continuation of advanced studies in the future. The course will provide vast scientific information and tools for analytical thinking in molecular biology for undergraduate students. Reading and analysis of research articles are included as part of the course duties. The course will also allow understanding of the structure-function relationship of RNA in the cell.

Learning outcomes - On successful completion of this module, students should be able to:

1. Describe and explain transcription, processing of RNA and protein translation 2. Describe and analyze regulatory mechanisms of these processes 3. Read and evaluate scientific research papers in molecular biology.

Attendance requirements(%):

None

Teaching arrangement and method of instruction: Lecture

Course/Module Content:

- RNA World Hypothesis
- Structure and function of catalytic RNA
- Selection and evolution of RNA in vitro
- Gene transcription by RNA polymerase I and epigenetics by small RNA
- Gene transcription by RNA polymerase III and regulation by small RNAs.
- mRNA splicing
- Regulation of alternative mRNA splicing
- Protein translation
- Regulation of translation

Required Reading:

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*Textbook: Genes XII by Benjamin Lewin*

*Additional Reading Material:*

*Selected research articles*

*Course/Module evaluation:*

*End of year written/oral examination 70 %*

*Presentation 0 %*

*Participation in Tutorials 30 %*

*Project work 0 %*

*Assignments 0 %*

*Reports 0 %*

*Research project 0 %*

*Quizzes 0 %*

*Other 0 %*

*Additional information:*

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