האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

Periodicity and Rhythmicity in Marine Ecosystems - 76703

Last update 03-11-2019

HU Credits: *6*

Degree/Cycle: *2nd degree (Master)*

Responsible Department: *Interuniversity Stud. for Marine Sci. at Eilat*

Academic year: *0*

Semester: *1st Semester*

Teaching Languages: *Hebrew*

Campus: *E. Safra*

Course/Module Coordinator: *Prof. Oren Levy*

Coordinator Email: *Oren.Levy@biu.ac.il*

Coordinator Office Hours: *By appointment*

Teaching Staff:
Dr.

Course/Module description:
A 10-day course. The course includes lectures, research projects, guided tours, and seminars. The course consists of two parts. The first part is theoretical, during which students are exposed to a variety of lectures in the field and it ends with an exam. In the second part, the research projects are carried-out and the student seminars are presented.

Course/Module aims:
The course introduces the concept of time and rhythm oscillations in behavior and activity of marine biological systems. For this purpose, the following questions are examined: how organisms measure time, what the biological clock affects physiologically and behaviorally, how the biological clock is structured at the molecular biochemical level, and what environmental signals synchronize the biological clock and periodicity. Special emphasis is placed on biological clocks in relation to the complexity of living environments, from the level of symbiotic relationships to the ecological niche. The students are acquainted with the marine system in the Gulf of Eilat and carry out research projects. The purpose of the projects is to implement the concepts and theories that the students acquire in the lectures on the phenomena that are under the control of the biological clock, in various marine systems such as the tidal environment, horizontal and vertical artificial structures and the coral reef.

Learning outcomes - On successful completion of this module, students should be able to:
To apply concepts, theories and methods used in the field in their scientific work.

Attendance requirements(%):
100

Teaching arrangement and method of instruction: Lectures, a group research project, guided excursions and seminars.

Course/Module Content:

Time - what is a unit of time in biological systems, what is periodicity?
The external clock facing the internal clock
Adjusting the internal clock to various environmental variables such as light, temperature and lunar cycles in marine environments.
Biological clocks in marine ecological niches.
Symbiosis and the biological clock.
Molecular biochemical structure of the biological clock.
Evolution of the biological clock.
The biological clock and metabolic processes.
Reproduction cycles, the effect of endogenous and exogenous variables.
Animal sensing, magnetism and gravitation.
Pineal gland: Melatonin, daily and annual cycles.
The biological clock under interference.
Biological clocks in marine mammals.
How social interaction initializes the biological clock in ecosystems.

Required Reading:
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Additional Reading Material:
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Course/Module evaluation:
End of year written/oral examination 50 %
Presentation 15 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 0 %
Reports 0 %
Research project 25 %
Quizzes 0 %
Other 10 %
TA evaluation

Additional information:
A 10-day intensive course at the Interuniversity Institute in Eilat.
The course is limited to M.Sc students, Ph.D students and third year undergraduate students, with a love for the sea and a biological background that allows them to take part in the course.