

The Hebrew University of Jerusalem

Syllabus

SUPERFLUIDITY AND QUANTIZED VORTICES - 77566

Last update 18-08-2016

<u>HU Credits:</u> 2

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: physics

<u>Academic year:</u> 0

<u>Semester:</u> 1st Semester

<u>Teaching Languages:</u> Hebrew

<u>Campus:</u> E. Safra

Course/Module Coordinator: Pr. William Glaberson

Coordinator Email: glabersn@vms.huji.ac.il

Coordinator Office Hours: By appointment

Teaching Staff:

Prof William Glaberson

<u>Course/Module description:</u> A seminar class in superfluidity.

<u>Course/Module aims:</u> See learning outcomes

<u>Learning outcomes - On successful completion of this module, students should be</u> <u>able to:</u> Learn a topic on his/her own and present it to the class.

Attendance requirements(%):

75

Teaching arrangement and method of instruction: Seminar

Course/Module Content:

Refrigeration techniques - adiabatic demagnetization, Pomeranchuk effect, dilution refrigeration, laser cooling. Superfluid phenomenology – fountain effect, two-fluid model, sound in superfluid, Bose-Einstein condensation. Vorticity – quantized hydrodynamics, vortex lines and rings, vortex-ion interaction, critical velocity. Vortex waves – Kelvin waves, Tkachenko waves, vortex lattice. Superfluidity in two dimensions. Other superfluids – superconductivity, superfluid He3, neutron stars, dilute Bose gases.

<u>Required Reading:</u> None

<u>Additional Reading Material:</u> The material will be specified at the beginning of the course.

<u>Course/Module evaluation:</u> End of year written/oral examination 0 % Presentation 100 % Participation in Tutorials 0 % Project work 0 % Assignments 0 % Reports 0 % Research project 0 % Quizzes 0 % Other 0 %

<u>Additional information:</u> None