

MAT 562: Symplectic Geometry

Syllabus

Important Remark: Given the special circumstances surrounding this semester, some details may change. I have done my best to provide contingencies in this document, and I have marked them in **RED**.

Course Website: <https://sites.google.com/view/ksackel/teaching/mat-562-fall-2020>

Time and Location: MW 1:00pm-2:20pm, in Javits 101 (subject to change). **In the case that the class moves online, we will have Zoom meetings, to occur at the usual time, the details of which will be sent to students in the class. In such an event, meetings will be recorded and posted on the course website with a password-protected link.**

Instructor: Kevin Sackel, kevin.sackel@stonybrook.edu

Office Hours: MW, 5:00pm-6:00pm, held over Zoom. Appointments set up via e-mail are welcome (and encouraged!).

Sources: Given the breadth of the course, we will use a number of sources, each of which focuses on different aspects of the material. Among them will be the following texts, which I have tried to include in the order that they will be used in the course. The color-coding is chosen to match the official course description from the bulletin.

- *Mathematical Methods of Classical Mechanics* - V.I. Arnold
- *Lectures on Symplectic Geometry* - A.C. da Silva
- *Introduction to Symplectic Topology* - D. McDuff and D. Salamon
- *An Introduction to Contact Topology* - H. Geiges
- *Introduction to the h-principle* - Y. Eliashberg and N. Mishachev
- *J-holomorphic Curves and Symplectic Topology* - D. McDuff and D. Salamon

Course Description (from bulletin): Hamilton's equations and their physical origin, symplectic manifolds and various submanifolds, Moser arguments including Darboux theorem and Moser neighborhood theorems, contact manifolds, contact hypersurfaces, symplectizations, Legendrian front diagrams, topological Legendrian knot invariants, almost complex

structures compatible with symplectic form, Hamiltonian group actions and symplectic reduction, symplectic toric manifolds, h-principle with emphasis on holonomic approximation theorem along with applications to symplectic and contact geometry, Gromov non squeezing theorem and a summary of pseudoholomorphic curve theory.

Assignments and Grades: Grades will be based upon occasional homework assignments. In the event that the class moves online, students will submit solutions to homework via e-mail.

Face Mask Policy:

Students should be aware that a face mask is required while in the classroom. If a student does not comply, the student will be asked to leave the classroom. If the student does not comply or leave the classroom, we will end the class and the students will be reported to the Office of Student Conduct and Community Standards at communitystandards@stonybrook.edu.

Some students with hearing and communication impairments may need their instructor to wear a clear mask for lip and facial expression purposes. If the student has registered with the Student Accessibility Support Center (SASC) and has requested an accommodation for clear masks, SASC will reach out to the student's instructors and provide a clear mask for them to wear while teaching and/or interacting with the student. If you have questions, please email sasc@stonybrook.edu or call (631) 632-6748.

The Student Accessibility Support Center (SASC) works with students who may require academic accommodations. If a student is unable to wear a mask for health reasons, the student should contact SASC at sasc@stonybrook.edu. SASC will work with the student to help identify arrangements to complete in-person courses in an alternate format. If, however, there is an in-person class that cannot be accommodated in an alternate format, a student may be approved by the Medical Director of Student Health Services to wear a modified face mask or no face covering. In this situation, SASC will communicate this information to the faculty member. Approved students will also be provided with a written exemption from the Medical Director of Student Health Services that indicates any modifications or exceptions, which they must carry with them to show faculty if requested. Please note that medical exemptions are rare and are based solely on medical necessity. If a student is exempt from the face mask policy, please consider how to seat students to ensure proper social distancing within a given instructional setting. If you have questions regarding accommodations, please email sasc@stonybrook.edu. For health related concerns in the classroom, please contact Dr. Rachel Bergeson, Medical Director, at rachel.bergeson@stonybrook.edu.

Student Accessibility Support Center Statement:

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Student Accessibility Support Center, ECC (Educational Communications Center) Building, Room 128, (631)632-6748. They will determine with

you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Student Accessibility Support Center. For procedures and information go to the following website: <http://www.stonybrook.edu/ehs/fire/disabilities>.

Academic Integrity Statement:

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html

Critical Incident Management:

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.