

**STATE UNIVERSITY OF NEW YORK -Korea**  
**DEPARTMENT OF MECHANICAL ENGINEERING**

Spring Semester 2021  
TTR: 3:30 – 4:50  
Room: On-line Zoom

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Office Hours: Mondays &  
Wednesdays: 2:30-4:00 PM (and any  
other time by appointment)

**MEC 511: Mechanics of Perfect Fluids**

Lagrangian and Eulerian frames. Dynamical equations of momentum and energy transfer. Two-dimensional dynamics of incompressible and barotropic perfect fluids and of the compressible perfect gas. Conformal mapping applied to two-dimensional fluid dynamics. Jets and cavities. Surface waves, internal waves. Perfect shear flows.

3 credits, Letter graded (A, A-, B+, etc.)

**TEXT:** Fundamental Mechanics of Fluids. 4th Edition. By I.G. Currie  
ISBN 9781439874608  
Publisher: CRC Press/ Taylor & Francis, 2012

**REFERENCES:**

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Theoretical Hydrodynamics 5th ed. Edition. By Milne Thomson  
ISBN-13: 978-0486689708  
ISBN-10: 0486689700  
Publisher: Dover Books on Physics, 1968

Hydrodynamics in Theory and Application. (International Series in Theoretical and Applied Mechanics: Fluid Mechanics Series). By James M. Robertson  
ISBN-10: 1114330639  
ISBN-13: 978-1114330634  
Publisher: Prentice Hall; 1st edition, 1965.

**SCOPE:**

**Governing Equations:** The derivation of the basic conservation laws, flow kinematics, and some basic theorems of fluid mechanics.

**Ideal-Fluid Flow:** Two- and three-dimensional potential flows.

**Surface Waves:** General surface-waves, small-amplitude plane waves.

**Compressible Flow of Inviscid Fluids:** Normal and oblique shocks, expansion waves, Rayleigh and Fanno Flows, linearized theory conical flows.

**Methods of Mathematical Analysis:** Some commonly used analysis techniques.

**GRADING:**

Homework	30%
Test 1	20%
Test 2	20%
Final Exam	30%

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Total 100%

**ACADEMIC HONESTY:**

The campus policies on academic honesty are available on the Web(<http://naples.cc.sunysb.edu/CAS/ajc.nsf/pages/info>).

Academic dishonesty is an extremely serious offense and will not be tolerated in any form. Academic dishonesty in general is the presentation of intellectual work that is not originally yours. Examples include, *but are not limited to*, copying or plagiarizing class assignments including homework, reports, and other submitted materials; copying or otherwise communicating answers on exams with other students; bringing unapproved aids, either in physical (written) or electronic form to an exam; obtaining copies of an exam prior to its administration, etc. Academic dishonesty violates both the ethical and moral standards of the Engineering profession and all infractions related to academic dishonesty will be prosecuted.

Faculty members are 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: [http://www.stonybrook.edu/commcms/academic\\_integrity/index.html](http://www.stonybrook.edu/commcms/academic_integrity/index.html)

**SPECIAL NOTE ON ADA:**

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact One-Stop Service Center, Academic Building A201, (82) 32-626-1117. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

**CRITICAL INCIDENT MANAGEMENT STATEMENT:**

The State University of New York, Korea expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn.

**ATTENDANCE POLICY of SUNY Korea:**

1. All students of SUNY Korea are required to attend everyclass.
2. Unexcused absences will affect seriously the student's final grade in the course.
3. If a student has over 20% unexcused absence, the student's final course grade will be an 'F'.
4. Students should report the reason of absence to the instructor in advance, or immediately after the absence.

5. When a student excuses his/her absence, the student must provide documentation of the reason for the absence to the instructor.
6. The instructor of the course reserves the right to excuse absences.
7. The course instructor may excuse the absence if the submitted documentation fulfills the conditions below. • Extreme emergencies (e.g. death in the family) • Severe medical reasons with doctor's note (Not a slight illness) • Very important events (e.g. national conference, official school event)
8. At the end of semester, the course instructor should submit a copy of the attendance sheet to the Academic Affairs Office.