MAT 342

Applied Complex Analysis

Lecturer: Mikhail Lyubich
Grader: Lilya Lyubich

We plan to cover basics of Complex Analysis and its various applications (including Potential Theory, Fluid Dynamics, and Quantum Mechanics). Though the development will be quite rigorous, formal proofs will not be our main emphasis. We will rather try to develop an appreciation of the new perspective, conceptual and technical, that this beautiful area of mathematics opens up.

Lectures: MWF 10:00 – 10:53, P-131.

Textbook:
J. Brown abd R. Churchill. Complex Variables and Applications, 9th edition.

The final grade will be based upon HW (25%), Midterm (35%) and the Final (40%).

Homeworks:
HW1 (due on Wed Sept 5) p. 7, # 1 (a), p. 13, # 5, 6, p. 16, # 13, p. 23, # 1, 4, 10, p. 30, # 1, 2, 6.
HW2 (due on Wed Sept 12) p. 43, # 2(b), 3, 5, 8; p. 61, # 2,4; p. 71, # 1 (c,d), 3(b,c); p. 76, # 1 (b,c), 2(a,c).
HW3 (due on Wed Sept 19) p. 89, # 4,7,10; p. 95, # 2,3,9; p. 99, # 1, 2, 4, 5;
HW4 (due on Wed Sept 26) p. 79, # 1,2,3; p. 357, # 1(a,b), 4; p. 96, # 7, 8; p. 353, # 6.
HW5 (due on Wed Oct 3) p. 132, # 1,6,9,10; p. 138 # 1 (b), 4, 6; p. 147, # 2,4, 5.
HW6 (due on Wed Oct 10) p. 159, # 1 (all), # 2 (all), # 7.
HW7 (due on Wed Oct 17) p. 170, # 1 (all), # 2 (all), # 7.
HW8 (due on Wed Oct 24) p. 177, # 1–7.
HW9 (due on Wed Oct 31) p. 195, # 1,2,4,6; p. 218, # 1,3,4,6.
HW10 (due on Wed Nov 7) p. 205, # 1–7.
HW11 (due on Wed Nov 14) p. 237, # 1,2,4 (all).
HW12 (due on **Mon Nov 19**) p. 246, # 1(a,c),2(a,b),3–6.

HW13 (due on Wed Nov 28) p. 301, # 3,4; p. 306, # 4, 10, 11, 12; p. 312, # 2,6,7; p. 317, # 3.

HW14 (due on Wed Dec 5) p. 325, # 1–4; p. 330, # 1–3, 7,8.

HW15 (due on **Wed Dec 12**: can be brought to the review session). Review and explain Figures 2,8,9, 14, 15, 16, 19 from Appendix 2. (No need in precise calculations in 14,15.); Also: p. 357, # 1, 2.

The **final** will cover chapters 1–9 and will contain 6 regular problems + a bonus problem. Each regular problem will consist of 3 items: a theoretical one (to give a definition or the statement of a theorem) and two exercises (an easy one and a more difficult one) related to the theoretical question. To solve correctly all regular problems (without even touching the bonus one) is enough for getting the full credit for the exam.

Special office hours: Mon Dec 17, 10–11am, 3–4pm.

Review session: Wed Dec 12, 10–11:30am, room ESS-069.

Practice quiz: Friday Nov 30 during the class.

Bonus quiz: Friday Nov 9 during the class.

Office hours: M. Lyubich: room 3-110 of the Math tower, Mon 11am–12:30pm and Thu 2:00–3:30pm.
   L. Lyubich: Tu 1:00-2:00pm (MLC) and Wed 11am–noon (room 3-110).

Midterm: Wed Oct 17 during the class

Final: Wed Dec 19, 2:15–5pm in the usual room (P131)