

Syllabus for Senior/Problem Solving Seminars, MAT 4510/4934 Spring 2024

Synopsis of the Problem Solving Seminar (MAT 4510)

This is a 3 credit course designed for students who have taken the basic math courses from the BA in Math/Education track. The students should have already abilities and some experience in solving basic math problems. The goal of the course is to strengthen further those abilities. This is achieved by teaching the students more advanced solving techniques, illustrating them by doing more challenging problems from the areas covered in the course.

The course is structured so that selected topics from different areas of math are covered through solving mostly out-of-the-box problems from different math competitions at a middle and high school level. The emphasis in the course is put exclusively on the strategies and the art of problem solving, building on the computational skills the students are expected to have acquired prior to enrolling the class. The suggested literature for the standard techniques of problem solving is:

D'Anjelo J. and D. West (1999), "Mathematical thinking...problem-solving and proofs", Second edition,

Prentice Hall.

Engel A. (1998), "Problem Solving Strategies", Springer.

A book for more interesting, non-standard approach to solving problems in math is:

Fomin, Genkin, Itenberg(1996) "Math Circles", AMS, University Press.

The students, who need that, will have the books as pdf or djvu files. Another source for such problems is Internet: freely available sets of problems for variety of math competitions in the U.S.A.

Grading policy

The overall grade is based on the work of the students in the discussions in class (15% of the grade), two HW assignments (25% of the grade each), and a final exam (35% of the grade).

Synopsis for the Senior Seminar (MAT 4934)

This is a one credit class designed to give the graduating Math and Math-Sci majors the venue (and the help) to prepare for their presentations and the exit exam in the class. The Seminar is not a place to learn things from scratch. It is a place mostly to review things, on a maybe higher level. The emphasis is put on students' presentations as opposed to the practice in the usual classes (Instructors' presentations). No (standard) Quizzes or Midterms will be performed here. Instead, the students will be developing "portfolios" based on their presentations (oral and written) during the semester. Final examination: Exit Exam (written).

Suggested books: the math books the students have used during their studies at FIU.

Content: The Seminar will cover topics from the following subjects:

Linear Algebra, Algebraic Structures, Advanced Calculus, Ordinary Differential Equations, Classical Partial Differential Equations, Probability/Statistics, Numerical Analysis, Discrete Mathematics, and Theory of Algorithms.

These topics will cover the material to be checked for both Math and Math-Science majors (the math part for the latter ones).

Math major subjects: LA, AlgStr, AdvC, ODE, P/S.

Math-Sci major subjects: LA, ODE, CPDE, P/S, NumAn, DM, ThAlg.

Grading policy

The overall grade is based on a presentation on a math topic (in front of the Undergraduate Committee) and on the result on a Exit Exam (designed by the Undergrad Committee).

Academic Misconduct Statement

Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly to demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to

understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook.

Academic Misconduct includes: **Cheating** – The unauthorized use of books, notes, aids, electronic sources; or assistance from another person with respect to examinations, course assignments, field service reports, class recitations; or the unauthorized possession of examination papers or course materials, whether originally authorized or not. **Plagiarism** – The use and appropriation of another’s work without any indication of the source and the representation of such work as the student’s own. Any student who fails to give credit for ideas, expressions or materials taken from another source, including internet sources, is responsible for plagiarism.

To learn more about the academic integrity policies and procedures visit integrity.fiu.edu ([Links to an external site.](#))

Accessibility and Accommodation

The Disability Resource Center collaborates with students, faculty, staff, and community members to create diverse learning environments that are usable, equitable, inclusive and sustainable. The DRC provides FIU students with disabilities the necessary support to successfully complete their education and participate in activities available to all students. If you have a diagnosed disability and plan to utilize academic accommodations, please contact the Center at 305-348-3532 or visit them at the Graham Center GC 190.

For additional assistance please contact FIU's [Disability Resource Center](#)

Important remark: The Instructor reserves the right to make any changes he considers academically advisable. Any such changes will be announced in advanced in class or by posting them to the e-mail accounts of the students. The students are responsible to be aware of the changes announced this way.