Syllabus

Math 411 – Numerical Linear Algebra

Spring 2015
Department of Mathematics
New Mexico Institute of Mining and Technology

Instructor
Dr. Rakhim Aitbayev, Weir 236, (575) 835-5463, aitbayev@nmt.edu
Office hours: TRF 2:00–3:30 P.M.

Class time and place:
TR 9:30–10:45 A.M., Weir 202

Textbook and references


Course webpage

http://www.nmt.edu/~aitbayev/math411

Homeworks assignments and important announcements will be posted on the course webpage.

Final score composition:  Homeworks: 100%

Homework rules

- Homework problems involve proofs, computer programming with MATLAB, and numerical computations.
- Homeworks are due in class. Late homework papers are accepted only until the next class meeting with 25 % score reduction.
- If the assignment involves computer programming, submit its text and formatted output. Give a summary and a discussion of your results.
- The two lowest homework scores will be dropped.
• Individual work is required on all graded assignments. You may discuss an assignment with classmates, but what you submit must be your own thoughts and work.

Final grade scale

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<thead>
<tr>
<th>Score (%)</th>
<th>0–60</th>
<th>60–66</th>
<th>66–69</th>
<th>70–71</th>
<th>71–76</th>
<th>76–79</th>
<th>79–81</th>
<th>81–86</th>
<th>86–89</th>
<th>89–91</th>
<th>91–100</th>
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</thead>
<tbody>
<tr>
<td>Grade</td>
<td>F</td>
<td>D</td>
<td>D+</td>
<td>C−</td>
<td>C</td>
<td>C+</td>
<td>B−</td>
<td>B</td>
<td>B+</td>
<td>A−</td>
<td>A</td>
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Course outline

• Chapter 1. Gaussian elimination and its variants.
• Chapter 2. Sensitivity of linear systems (2.1–2.4).
• Chapter 3. The least squares problem (3.1–3.5).
• Chapter 4. The singular value decomposition (4.1–4.3).
• Chapter 5. Eigenvalues and eigenvectors I.
• Chapter 8. Iterative methods for linear systems.

Academic honesty policy

Students must follow the NMT Academic Honesty Policy available in the NMT catalog.

Auditing

At least 85% attendance is required for the SA grade (four lectures may be missed at most). Please let me know immediately about your auditing status.

Disability accommodations

NMT is committed to protecting the rights of individuals with disabilities. Qualified individuals who require reasonable accommodations are invited to make their needs known to the Office of Counseling and Disability Services (835-6619) as soon as possible.

Course learning outcomes

At the end of the course students will:

• Know basic algorithms of numerical linear algebra for dense and band matrices,
• Be able to develop numerical linear algebra algorithms using matrix partitioning,
• Be able to compose computer programs implementing basic algorithms of numerical linear algebra,
• Be able to use orthogonal (rotators and reflectors) transformations and orthogonal similarity transformations to zero matrix entries,
• Know a few good programming rules,
• Be able to prove basic matrix factorization theorems,
• Understand basic concepts of classical and Krylov subspace iterative methods for solving linear algebra problems.

Program learning outcomes

http://infohost.nmt.edu/~math/about/mission.html