

MATH 471 SECTION 201  
 SUMMER 2010  
**Numerical Methods**

Timeline

**Covered** To be covered 1 block = 2 hrs, 1 row = 2 weeks

|         |            |            |            |            |            |            |
|---------|------------|------------|------------|------------|------------|------------|
|         | Jun. 30    | §1.1—1.4   | §2.1 — ... | ... — §2.5 | §3.1 — ... | .....      |
| Jul. 13 | .....      | .....      | ... — §3.8 | §8.1—8.2   | §9.1—9.3   | §4.1 — ... |
| Jul. 27 | ... — §4.3 | §5.1 — ... | no §5.4    | ... — §5.6 | §6.1 — ... | .....      |
| Aug. 10 | ... — §6.6 | §7.1 — ... | ... — §7.4 |            |            |            |

**Syllabus** (tentative), totally 40 hrs.

1. Algorithms, convergence and floating-point arithmetic (§1.1-1.4) , 2 hrs
2. Nonlinear equations and root-finding (§2.1-2.5), 4 hrs
3. Numerical linear algebra (§3.1-3.8) , 10 hrs
4. Two-point boundary value problems (§8.1-8.2), 2 hrs
5. Poisson equation on a rectangle (§9.1-9.3), 2 hrs
6. Eigenvalues and eigenvectors (§4.1-4.3) , 4 hrs
7. Polynomial and spline interpolation (§5.1-5.6 except 5.4), 6 hrs
8. Numerical differentiation and integration (§6.1-6.6), 6 hrs
9. Initial value problems for ordinary diff equations (§7.1-7.4 and implicit methods), 4 hrs

## Learning Chart

| Hour  | Brief Notes |
|-------|-------------|
| 1-2   |             |
| 3-4   |             |
| 5-6   |             |
| 7-8   |             |
| 9-10  |             |
| 11-12 |             |
| 13-14 |             |
| 15-16 |             |
| 17-18 |             |
| 19-20 |             |
| 21-22 |             |
| 23-24 |             |
| 25-26 |             |
| 27-28 |             |
| 29-30 |             |
| 31-32 |             |
| 33-34 |             |
| 35-36 |             |
| 37-38 |             |
| 41-40 |             |