

**Text** We will be using *Introduction to Linear Algebra* by Lee W. Johnson, R. Dean Riess, Jimmy T. Arnold (Fourth Edition). We will cover material from Chapters 1 through 4 — see the attached **tentative** schedule for the exact sections covered. The Bookstore also has a *highly* recommended text: *The Nuts and Bolts of Proofs* by Antonella Cupillari. The course WWW page has some recommendations for similar books.

**Home Page** Start at <http://buzzard.ups.edu/courses.html> to locate the WWW page for this course.

**Office Hours** My office is Thompson 321G; the telephone number is 879-3564. Making appointments or simple, non-mathematical questions can be handled via electronic mail — my address is [beezer@ups.edu](mailto:beezer@ups.edu). Office hours will be 9:00-10:00 on Monday, Tuesday, Thursday and Friday. I will always be available during these times on a first-come, first-served basis. If these times are not convenient, please do not hesitate to make an appointment with me for another time. You are also welcome to drop by my office without an appointment at any time that I am in (1 P.M. – 4 P.M. is a good time to try). We will have group office hours for this course on Wednesdays, 11:00 A.M. – Noon. Office hours are your opportunity to receive extra help or clarification on material from class, or to discuss any other aspect of the course.

**Calculators** This course requires the use of a calculator. It should be capable of doing matrix operations — specifically “reduced row echelon form,” “determinants” and “eigenvalues and eigenvectors.” I highly recommend the Texas Instruments TI-86, which is what I will be using, since this is the model currently used in our calculus courses. These are available at the bookstore, though you must ask for them at the checkout counter. It is not required that you use this exact model, but whatever you use should have the capabilities listed above. If you no longer have a manual for the TI-86, check the course WWW page for a link to an electronic version (you will especially want Chapter 13, and possibly Chapter 12).

**Homework** Suggested exercises are attached and are posted on the course WWW page. It is expected that you will work these problems, but they will not be collected. Of course, you are not limited to working *just* these problems. These exercises will form the basis for the classes where we will have problem sessions and for discussions in office hours (group or otherwise). It is your responsibility to be certain that you are learning from these exercises. The best ways to do this are to work the problems diligently when assigned and to participate in the classroom discussions. If you are unsure about a problem, then a visit to my office is in order. Making a consistent effort outside of the classroom is the easiest way to do well in this course.

Mathematics not only demands straight thinking, it grants the student the satisfaction of knowing when he [or she] is thinking straight. — D. Jackson

Mathematics is not a spectator sport. — Anonymous

I hear, I forget.

I see, I remember.

I do, I understand.

— Chinese Proverb

**Quizzes** There will be seven 50-minute timed quizzes — they are all included on the *tentative* schedule. The lowest of your seven quiz scores will be dropped. The comprehensive final exam will be given at Noon on Thursday, May 16. The final exam cannot be given at any other time, so be certain that you do not make any travel plans that conflict, and since this exam falls late in finals week also be aware that I will allow you to work longer on the final exam than just the two-hour scheduled block of time. In other words, plan your travel arrangements accordingly.

**Writing** This course has been designated as part of the University's Writing in the Major requirement. Thus, there will be an emphasis on the quality of the mathematical exposition in your written work, and there will be two assignments that will be primarily graded on the basis of the exposition. These assignments will not be accepted late.

**Grades** Grades will be based on the following breakdown: Quizzes — 60%; Writing — 15%; Final — 25%. Reading questions, attendance and improvement will be considered for borderline grades. Scores will be posted on the World Wide Web at <http://buzzard.ups.edu/courses.html>. A reminder about withdrawals — a Withdrawal Passing grade (W) can only be given during the third or fourth weeks of the semester, after that time (barring unusual circumstances), the appropriate grade is a Withdrawal Failing (WF), *even if your work has been of passing quality*. See the attached schedule for the last day to drop with an automatic 'W' and please read *The Logger* about these often misunderstood grades.

**Attendance** Daily attendance is required, expected, and overall a pretty good idea.

**Purpose** This course is much different from most any mathematics course you have had recently, in particular it is much different than calculus courses. We will begin with a simple idea — a linear function — and build up an impressive, beautiful, abstract theory. We will begin computationally, but quickly shift to concentrating on theorems and their proofs. By the end of the course you will be at ease reading and understanding complicated proofs. You will also be very good at writing routine proofs and will have begun the process of learning how to create complicated proofs yourself.

You will see this material applied in subsequent courses in mathematics, computer science, chemistry, physics, economics and other disciplines (though we will not have much time for applications this semester). You will gain a “mathematical maturity” that will be helpful as you pursue upper-division coursework. It is not easy material, but your attention and hard work will be amply repaid with an in-depth knowledge of some very interesting ideas.

## Tentative Daily Schedule

Monday	Tuesday	Thursday	Friday
Jan 21 MLK Day	Jan 22 Section 1.1	Jan 24 Section 1.2	Jan 25 Section 1.3
Jan 28 Section 1.5	Jan 29 Problem Session	Jan 31 Quiz # 1	Feb 1 Section 1.6
Feb 4 Section 1.6/1.7	Feb 5 Section 1.7	Feb 7 Section 1.9	Feb 8 Section 1.9
Feb 11 Problem Session	Feb 12 Quiz # 2	Feb 14 Writing Discussion	Feb 15 Section 2.2
Feb 18 Section 2.2 Last day to drop	Feb 19 Section 2.3	Feb 21 Section 2.3	Feb 22 Section 2.4
Feb 25 Problem Session	Feb 26 Quiz # 3	Feb 28 Section 2.5	Mar 1 Section 2.5
Mar 4 Section 2.6 Writing # 1 Due	Mar 5 Section 2.7	Mar 7 Section 2.7	Mar 8 Problem Session
Mar 11 Quiz # 4	Mar 12 Section 3.2	Mar 14 Section 3.1	Mar 15 Section 3.4 Midterm

Midterm Break

Monday	Tuesday	Thursday	Friday
Mar 25 Section 3.5	Mar 26 Section 3.6	Mar 28 Section 3.7	Mar 29 Section 3.7
Apr 1 Problem Session	Apr 2 Quiz # 5	Apr 4 Writing Discussion	Apr 5 Section 4.2
Apr 8 Section 4.2	Apr 9 Section 4.3	Apr 11 Section 4.3/4.4	Apr 12 Section 4.4
Apr 15 Section 4.5	Apr 16 Problem Session	Apr 18 Quiz # 6	Apr 19 Section 4.7
Apr 22 Section 4.7 Writing # 2 Due	Apr 23 Section 4.8	Apr 25 Section 4.8	Apr 26 Section 4.9
Apr 29 Section 4.9	Apr 30 Section 4.10	May 2 Section 4.10	May 3 Problem Session
May 6 Quiz # 7	May 7 Housekeeping		

Final Examinations  
Thursday, May 16 at Noon

## Homework Exercises

Section	Page	Computational	Theoretical
1.1	11	1, 2, 8, 11, 14, 27, 31, 34, 42	38
1.2	24	3, 5, 8, 13, 15, 17, 21, 23, 27, 29, 31, 38, 47, 49, 53	
1.3	36	1, 3, 5, 6, 7-19 odd, 25	
1.5	57	1, 3, 7, 11, 15, 23, 31, 33, 34, 35, 40, 45, 55, 63	59, 60, 67
1.6	68	1, 3, 5, 17, 21, 26, 27, 30, 31, 32	44, 46, 47
1.7	78	1-13 odd, 17, 23, 27, 30, 41, 43	47, 49, 50, 51
1.9	102	3, 7, 19, 23, 29, 37, 39	52, 53, 54, 56, 66
2.1	116	5, 7, 13, 15, 23, 25, 28	
2.2	124	3, 5, 7, 15, 17	18, 21, 27, 30, 31, 32
2.3	137	15, 17, 19, 21, 25, 27-35 odd, 39, 41, 47	50, 51, 52
2.4	150	1, 3, 7, 9, 11, 13, 19, 23, 27, 33	30, 38
2.5	162	7, 8, 9, 17, 23, 25, 27, 29	30, 31, 32, 36, 38, 40
2.6	174	3, 5, 9, 12, 13	22, 25, 28
2.7	190	1ab, 2ab, 3ab, 5, 7, 11, 13, 15, 17, 19, 29	33, 37, 38
3.2	237	1-4, 7, 9, 11, 17, 18, 19	23, 24, 33, 34
3.1	229	3, 5, 7, 9, 15	17, 19
3.4	254	3, 5, 7, 9, 13, 21	15, 25, 30
3.5	262	3, 5, 7, 9, 13, 17, 19, 27	21, 22, 23, 24, 25, 28, 29
3.6	273	7, 9, 11, 15, 21, 23, 33	36, 37, 38, 40, 41
3.7	285	3, 5, 7, 15, 17, 21	25, 26, 27, 29, 30, 43
4.2	314	1, 2, 3, 5, 9, 11, 13, 15, 18, 19	21, 34, 36
4.3	321	1, 3, 5, 7, 9, 13, 17, 19, 23, 27, 32	28, 29, 30
4.4	334	1, 3, 5, 7, 13, 14, 15, 17, 19, 21, 24, 27, 31	32, 36, 37, 38
4.5	338	1, 4, 5, 7, 9, 11, 13	2, 17, 18
4.7	358	5, 7, 9, 13, 16, 17	18, 19, 20, 21, 22, 26
4.8	366	1-6, 7, 9, 11	18, 19, 20, 21, 23-28
4.9	377	1-10, 13, 14-16, 19	28, 30
4.10	386	1, 3, 6, 9, 10, 11, 15, 16	17, 18, 19, 20