Course Guidelines | Math 232B
Dr. R. Beezer | Fall 2001

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 may have two recommended texts — I **highly** recommend the first one: *The Nuts and Bolts of Proofs* by Antonella Cupillari, *Thinking Mathematically* by John Mason.

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`. Office hours will be 9:30–10:30 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 (2 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 one-hour 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, December 13. The final exam cannot be given at any other time, so be certain that you do not make any travel plans that conflict, and also be aware that I will allow you to work longer on the final exam than just the two-hour scheduled block of time.

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 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
Aug 27 Section 1.1	Aug 28 Section 1.2	Aug 30 Section 1.3	Aug 31 Section 1.5
Sep 3 Labor Day	Sep 4 Problem Session	Sep 6 Quiz #1	Sep 7 Section 1.6
Sep 10 Section 1.7	Sep 11 Sections 1.7/1.9	Sep 13 Section 1.9	Sep 14 Problem Session
Sep 17 Quiz #2	Sep 18 Writing Discussion	Sep 20 Section 2.2	Sep 21 Section 2.2
Sep 24 Section 2.3 Last day to drop	Sep 25 Section 2.3	Sep 27 Section 2.4	Sep 28 Problem Session
Oct 1 Quiz #3	Oct 2 Section 2.5	Oct 4 Section 2.5	Oct 5 Section 2.6
Oct 8 Section 2.7	Oct 9 Section 2.7	Oct 11 Problem Session	Oct 12 Quiz #4

Midterm Break

Monday	Tuesday	Thursday	Friday
Oct 15 Fall Break	Oct 16 Writing Discussion	Oct 18 Section 3.2	Oct 19 Section 3.1
Oct 22 Sections 3.4/3.5	Oct 23 Section 3.6	Oct 25 Section 3.7	Oct 26 Section 3.7
Oct 29 Problem Session	Oct 30 Quiz #5	Nov 1 Section 4.2	Nov 2 Section 4.2
Nov 5 Section 4.3	Nov 6 Section 4.3	Nov 8 Section 4.4	Nov 9 Section 4.4
Nov 12 Section 4.5	Nov 13 Problem Session	Nov 15 Quiz #6	Nov 16 Section 4.7
Nov 19 Sections 4.7/4.8	Nov 20 Section 4.8	Nov 22 Thanksgiving	Nov 23 Thanksgiving
Nov 26 Section 4.9	Nov 27 Section 4.9	Nov 29 Section 4.10	Nov 30 Section 4.10
Dec 3 Problem Session	Dec 4 Quiz #7		

Final Examination

Thursday, December 13 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