Course Guidelines | Math 232B
Dr. R. Beezer | Fall 2003

Text We will be using *Introduction to Linear Algebra* by Lee W. Johnson, R. Dean Riess, Jimmy T. Arnold (Fifth Edition). We will cover material from Chapters 1, 3, 4, and 5 — 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. Also available at the Bookstore are my course notes, which we will work through in class.

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 10:00–10:50 on Monday, Wednesday and Friday and 9:30–10:50 on Tuesday. 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 (roughly 2 P.M. – 4 P.M. is a good time to try). I will likely schedule additional "group office hours", possibly on Tuesday afternoons, so you may want to reserve this period of time. 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 will be 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 six 50-minute timed quizzes — they are all included on the *tentative* schedule. The lowest of your six quiz scores will be dropped. The comprehensive final exam will be given at 8 A.M. on Wednesday, December 17. The final exam cannot be given at any other time 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. 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.

Reading Questions On the WWW course page you will find reading questions for each section of the book. Once you have read the section *prior* to our in-class discussion, submit your responses to the reading question via electronic mail, as described on the course page, paying careful attention to all deadlines and procedures.

Grades Grades will be based on the following breakdown: Quizzes — 60%; Reading Questions — 5%, Writing — 15%; Final — 20%. 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 and fundamental ideas.

Homework Exercises

Section	Page	Computational	Theoretical
1.1	12	1, 2, 8, 11, 14, 27, 31, 34, 42	39
1.2	26	3, 5, 8, 13, 15, 17, 21, 23, 27, 29, 31, 38, 49, 50, 53	
1.3	37	1, 3, 5, 6, 7-17 odd, 19, 21, 25	
1.5	58	1, 3, 7, 11, 15, 23, 31, 33, 34, 35, 40, 45, 55, 63	59, 60, 67
Quiz #1			
1.6	69	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	49, 51, 52, 53
1.9	104	3, 7, 19, 23, 31, 39, 41	54, 55, 56, 58, 68
Quiz #2			
3.1	167	5, 7, 13, 15, 23, 25, 28	
3.2	175	3, 5, 7, 15, 17	18, 21, 27, 30, 31, 32
3.3	186	15, 17, 19, 21, 25, 27-35 odd, 39, 41, 47	50, 51, 52
3.4	200	1, 3, 7, 9, 11, 13, 19, 23, 27, 33	30, 38
3.5	212	7, 8, 9, 17, 23, 25, 27, 29	30, 31, 32, 36, 38, 40
3.6	224	3, 5, 9, 12, 13	22, 25, 28
3.7	239	1ab, 2ab, 3ab, 5, 7, 11, 13, 15, 17, 19, 29	33, 37, 38
Quiz #3			
4.2	288	1-4, 7, 9, 11, 17, 18, 19	23, 24, 33, 34
4.1	279	3, 5, 7, 9, 15	17, 19
4.4	305	3, 5, 7, 9, 13, 21	15, 25, 30
4.5	314	3, 5, 7, 9, 13, 17, 19, 27	21, 22, 23, 24, 25, 28, 29
4.6	324	7, 9, 11, 15, 21, 23, 33	36, 37, 38, 40, 41
4.7	336	3, 5, 7, 15, 17, 21	25, 26, 27, 29, 30, 43
Quiz #4			
5.2	368	1, 2, 3, 5, 9, 11, 13, 15, 18, 19	21, 34, 36
5.3	373	1, 3, 5, 7, 9, 13, 17, 19, 23, 27, 32	28, 29, 30
5.4	386	1, 3, 5, 7, 13, 14, 15, 17, 19, 21, 24, 27, 31	32, 36, 37, 38
5.5	390	1, 4, 5, 7, 9, 11, 13	2, 17, 18
Quiz #5			
5.7	410	5, 7, 9, 13, 16, 17	18, 19, 20, 21, 22, 26
5.8	418	1-6, 7, 9, 11	18, 19, 20, 21, 23-28
5.9	429	1-10, 13, 14-16, 19	28, 30
5.10	438	1, 3, 6, 9, 10, 11, 15, 16	17, 18, 19, 20
Quiz #6			

Tentative Daily Schedule

Monday	Tuesday	Wednesday	Friday
Sep 1 Labor Day	Sep 2 Section 1.1	Sep 3 Section 1.2	Sep 5 Problem Session
Sep 8 Section 1.3	Sep 9 Section 1.5	Sep 10 Problem Session	Sep 12 Quiz #1
Sep 15 Section 1.6	Sep 16 Section 1.6/1.7	Sep 17 Section 1.7	Sep 19 Problem Session
Sep 22 Section 1.9	Sep 23 Section 1.9	Sep 24 Problem Session	Sep 26 Quiz #2
Sep 29 Writing Discussion Last day to drop	Sep 30 Section 3.2	Oct 1 Section 3.3	Oct 3 Section 3.3
Oct 6 Section 3.4	Oct 7 Problem Session	Oct 8 Section 3.5	Oct 10 Section 3.7
Oct 13 Section 3.7	Oct 14 Problem Session	Oct 15 Quiz #3	Oct 17 Section 4.2 Writing #1 Due

Mid-Term

Monday	Tuesday	Wednesday	Friday
Oct 20 Fall Break	Oct 21 Section 4.1	Oct 22 Section 4.4 Thurs: Sec. 4.5	Oct 24 Section 4.6
Oct 27 Section 4.7	Oct 28 Section 4.7	Oct 29 Problem Session	Oct 31 Quiz #4
Nov 3 Section 5.2	Nov 4 Section 5.2/5.3	Nov 5 Section 5.3	Nov 7 No class
Nov 10 Problem Session	Nov 11 Section 5.4	Nov 12 Section 5.5	Nov 14 Problem Session
Nov 17 Quiz #5	Nov 18 Writing Discussion	Nov 19 Section 5.7	Nov 21 Section 5.7
Nov 24 Section 5.8	Nov 25 Section 5.8	Nov 26 Problem Session	Nov 28 Thanksgiving
Dec 1 Section 5.9	Dec 2 Section 5.9	Dec 3 Section 5.10	Dec 5 Section 5.10
Dec 8 Problem Session	Dec 9 Quiz #6	Dec 10 Housekeeping	

Final Examinations

Wednesday, December 17 at 8 A.M.