Instructor Notes: Instructions for using Transparency Masters

Rationale for using Overhead Transparencies

Over the past four years, I have been writing lecture notes for most of the core sections in *Linear Algebra and Its Applications, by David C. Lay*, using an inexpensive, user-friendly software program called *Scientific Notebook*. I have class-tested all of these lecture notes and they have been very popular with my students.

Most of the lecture notes follow the textbook closely, but almost all of the examples appearing in these notes are different than those found in the textbook. Occasionally I present material in a slightly different order that the material found in the textbook and in a couple of cases, such as in Section 4.9, I have included only part of the material presented in the textbook. You will also note that I do not present the definitions of a one-to-one and onto mapping, but I still present the Invertible Matrix Theorem in its entirety with the statements concerning a one-to-one transformation included. I also give an informal definition of an isomorphism in the lecture notes. *However, one of my goals for creating these notes is to give you the ability to edit these notes to suit your own needs.* Later on in this introduction, I will show you how to edit the notes.

One of the reasons that I believe these notes work so well in class is that I give each of my students a copy of the lecture notes. I present the lecture notes in 18-point type on an overhead projector and I provide my students with the same content in a smaller font size. In this way, students don't have to try to copy down notes I am presenting in class and therefore they have more time to concentrate on the material being presented to them.

I wrote these notes with the following objectives in mind:

Allow students time to concentrate on lecture material

In the past, I noticed that when I presented a lecture on the blackboard, some students would copy down my blackboard notes without listening to what I was saying. Providing students with a copy of the lecture notes allows them to spend more time listening and comprehending the material.

Less lecture time / More discussion time

Lecturing using an overhead allows me to present material in a shorter period of time and it frees up more time to discuss homework in class. Typically, I will lecture for about 30 to 35 minutes after about a 20-minute period of discussing homework problems in class.

In class testing these transparencies, I came to learn the importance of keeping students active in the lecture process. When I first started writing these notes,

students did not have to write down any additional notes during lecture. Under this format, it was easy for students to drift off and lose their concentration during lecture. So when I revised my notes for the following year, I began to deliberately leave blanks in the notes where students would have to fill in words or label illustrations. In this way, students are better able to maintain their concentration during lecture because they are actively engaged in the lecture process. I now use an erasable overhead projector pen to fill in the missing material as I proceed through a lecture and students concurrently fill in the missing material on their copy of the notes.

How to use the Transparencies

The lecture notes are available in two forms. Documents with the **`.tex`** extension were created with *Scientific Notebook* and you are welcome to open and edit these documents using *Scientific Notebook*. The files with the **`.pdf`** extension can be viewed using Adobe Acrobat Reader which is commonly installed on most desktop computers. If you do not have Adobe Acrobat Reader on your machine, go to

http://www.adobe.com/products/acrobat/readermain.html

to download a free copy.

Adobe Acrobat Documents

If you do not have a copy of *Scientific Notebook* or if you do not wish to edit and customize the lecture notes, then you can use *Adobe Acrobat* or *Adobe Acrobat Reader* to access the files with a **`.pdf`** extension. Each set of lecture notes correspond to a particular section in *Linear Algebra and Its Applications, Third Edition* and all the lecture notes are available in two font sizes. The notes appearing in the smaller, 12-point font size are intended to be used as class handouts for students and the larger, 18-point type notes can be used to create transparencies. The files containing student notes have names of the form **`sec(Chapter#)_(Section#).pdf`** and the transparency masters are in files with names of the form **`sec(Chapter#)_(Section#)ov.pdf`**. For example, the file **`sec2_1.pdf`** contains lecture notes in 12-point type for Section 2.1 in the text and the file **`sec2_1ov.pdf`** contains identically the same content in 18-point type.

While I have used these notes in their entirety in my lectures, it may be more likely that you will pick and choose portions of these notes to present in class. This is one of the reasons I did not number the examples in the transparencies. For example, your students might find it strange if you presented an example in the notes called **Example 3** if you chose not to present the first two examples contained in that particular set of transparencies.

Customizing Lecture Notes using *Scientific Notebook*

You can use *Scientific Notebook* to edit and customize the lecture notes to your own liking. This program is inexpensive and easy to use. As of June, 2003, the cost of

Scientific Notebook for instructors and students was about $45. Go to http://www.mackichan.com/ for more information about *Scientific Notebook*.

The notes in 18-point font size have the form **sec(Chapter#)_(Section#)ov.tex** and the notes in 12-point font size have the form **sec(Chapter#)_(Section#).tex**.

You will first need to place the document **my_overhead.cst** into the article folder before you can open any of the files with names of the form **sec(Chapter#)_(Section#)ov.tex**. This is a style document which I created to quickly convert a *Scientific Notebook* file to18-point font size. Here is the path to this folder:

C:\Program Files\Scientific Notebook\Styles\article

If you can't find this path, try the following instead:

C:\Program Files\SciNotebook\Styles\article\

Once this style file has been loaded, use the following two steps to edit the lecture notes.

1. Create the Overhead Transparency Masters

For example, if you want to edit the notes for Section 2.1, open the document **sec2_1ov.tex**. Then edit the document and resave it on your hard drive. To preview your document, go to the *Scientific Notebook* menu and select **File** followed by **Page Setup**... . Note that the illustrations may not show up when previewing the document, but they will appear when you print the file.

2. Convert the Overhead Transparencies to 12 point type for Class Handouts

I think it is important to give students copies of your notes. To save paper, create a copy of your notes in 12-point type. To quickly convert the file you edited in step 1 to a document with 12-point font size, save **sec2_1ov.tex** as **sec2_1.tex** and then select **Style** from the **File** menu and under **Style**, select **math**. *Scientific Notebook,* upon your approval, will then resave and display your document in 12-point type. You will then have to delete and perhaps insert new page breaks to get rid of the unnecessary spacing appearing in your document.

If you ever want to convert a *Scientific Notebook* file to 18-point type and you have successfully installed **my_overhead.cst** as described earlier in this introduction, then select **Style** from the **File** menu and under **Style**, select **my_overhead**. *Scientific Notebook* will then resave and display your document in 18-point font size.

Other Ways of Making Lecture Notes Available to Students

If your departmental budget prohibits you from printing out class notes for your students, then you can make class notes available electronically by either:

- sending the notes to your students as an e-mail attachment;
- saving the notes in a file on the college/university hard drive in a location available to students;
- create hyperlinks in your class webpage where students can access the notes.

If you are making the notes available to students in pdf form, then make sure they have *Adobe Acrobat Reader* available on their machines. If necessary, you can direct them to

http://www.adobe.com/products/acrobat/readermain.html

where they can download their own free copy of *Adobe Acrobat Reader*.

If you are editing the notes and you wish to make the notes available to your students as *Scientific Notebook* documents, then these documents can be opened using *Scientific Viewer*. This software is free and available online. Go to http://www.mackichan.com/ for more details.

Annotated Lecture Notes

The class of files with the name **`sec(chapter#).(section#)an.pdf`** are annotated notes for all the transparency masters. You can view these files to see how I fill in the missing blanks in the lecture notes. For example, if you open **`sec2_1an.pdf`**, you will see that I have filled in all the missing blanks by hand and I have added other extra comments.

Feedback from You

Please feel free to use these lecture notes in any manner in which you see fit. I welcome any questions, comments or suggestions that you might have which would make these notes better. Please e-mail me your comments and suggestions.

Lyle Cochran
Whitworth College
Department of Mathematics and Computer Science
Spokane, WA 99251
e-mail: lcochran@whitworth.edu