

# STUDENT LAB SYLLABUS

Em1 lab

Fall 09

WEB PAGE: <http://www.math.fsu.edu/~bellenot/class/f09/lalab>

MEETING TIMES: W 10:10-11:00 315 HCB

LAB INSTRUCTOR Dr Steven Bellenot

OFFICE 223 Love

LAB OFFICE HOURS TBA in computer classroom 107 MCH

OFFICE HOURS MW3:30-4:30, W1:30-2:20 or by appointment

EMAIL [bellenot@math.fsu.edu](mailto:bellenot@math.fsu.edu)

WEB <http://www.math.fsu.edu/~bellenot>

OFFICE PHONE 644-7405

**ELIGIBILITY:** It is a part of MAP 3305.

**TEXT:** Two on-line textbooks are used in this class. Both are free. However, webassign is required for homework and it is not free. (Webassign does give a free grace period at the beginning of the semester.)

**CALCULATOR:** No calculators or other electronic devices are allowed on the exam or quizzes.

**COURSE OBJECTIVES:** The purpose of this lab is to review matrix operations by use of the software Scilab and to introduce students to eigenvalues and eigenvectors.

**ATTENDANCE:** Attendance and class participation will be factors in determining the final grade. No food or drinks are allowed in the classroom. Please turn off cell phones and keep them hidden during class. It is considered rude and unacceptable to leave class early, students leaving early will be penalized.

**COMMUNICATION:** It is your responsibility to register for a (free) FSU computer account so that I can send you email, which you are expected to check regularly. If you prefer to read your email elsewhere then you can arrange to have messages forwarded, but you must still obtain an FSU account in the first instance.

**GRADING/EXAMS:** There will be 2 tests and a collection of homeworks and small projects. Your grade will be based on how well you do on the tests (80%) and the homework and labs (20%). There might also be no-fault quizzes at the beginning of each period, these cannot hurt your grade, only help it. Emath1 students will have their lab grade included as part of their Emath1 grade.

**EXAM POLICY:** No makeup tests will be given. Late or unstapled assignments will not be normally be accepted. A missed test may be excused if the student presents sufficient verifiable evidence of extenuation circumstances. And unexcused absence from a test will be penalized. If a test absence is excused, then either a the next test, or at the instructors discretion, an oral test might be given. An unexcused missed assignment will result in a grade of zero. Absences from tests or missing assignments due to family social events will not be excused. Acceptable medical excuses must state explicitly that the student should be excused from class. Students must bring FSU ID cards to all tests.

**HOMEWORK:** Homework will consist of a few on-line homework problems per week. Most students will find that the amount of assigned homework is too small to provide enough practice to become proficient in the material. Please do additional problems as needed. The class web page has the (tentative) schedule for the semester.

**COMPUTER ASSISTED INSTRUCTION:** All computer assignments are due 5 pm; every effort will be made to ensure on-line hw problems are always available. However, the time limits will not be changed, even if networks problems occur and the problems are not available.

**HELP:** There is wealth of information on our web pages, be sure to check them before emailing me. (If the answer is on our web pages, I will not give the answer by email.) Sorry, I will only compute your grade once at the end of the semester; but all grades are on-line and you can compute own grade at any time. Do not hesitate to come to my office hours, or to contact me via email. I check my email often, and give prompt replys to any emailed questions from my students. For debugging scilab, please sent the input and the output and error messages as text. (Please – no html formated email, send text only. For files with graphics, I will look at PDF files but not word .doc files) All projects must be turned in in hard copy.

## Details

- How I grade problems: There are several steps to solving a matrix problem. One must understand the problem. One must select a method of solution which is not only correct but is efficient. One must execute the method and communicate its execution correctly. Finally the results must be checked for reasonableness of your answer. Partial credit is awarded with these factors in mind relative to the difficulty of the problem. Adding  $2 + 2$  and getting 5 in the course of a problem could result in a score of 0/10 if the problem was  $2 + 2 = ?$ , to getting 10/10 if it was a silly mistake at the end of a two page problem solution.

Incorrect answers that are unreasonable are not given much partial credit. For example, the answer  $x = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$  to the question find a solution to  $AX = 0$  when  $A$  is a  $3 \times 3$  matrix

$$A = \begin{bmatrix} 10 & -10 & 0 \\ 5 & -5 & 0 \\ -12 & 12 & 0 \end{bmatrix}$$

is unreasonable because any solution would have to be a  $3 \times 1$  matrix. Even though the error is a simple one, it is an error that should have been caught in the “is this answer reasonable phase”. What must you check so your answer is reasonable? This is one of the best reasons to attend class, it is not in the text.

Mathematics provides for many short calculations but correct communication requires sticking to mathematical rules. In particular, equations  $\text{RHS} = \text{LHS}$  should only be used when the RHS and the LHS are equal. For example, the following row reduction contains two  $=$ -signs and neither is used correctly.

$$\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 1 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

The answer is wrong because row reduction is not the same as the equal operator. This kind of mistake is often caused by laziness rather than lack of understanding, or is it? It doesn't communicate understanding and so it does not deserve full credit.

Most matrix problems are long. Sometimes students are required to use certain shortcuts. Failure to use the shortcut, will lower credit on the problem even when the longer method is used correctly. Thus choosing a correct but slow method can cost you both points on the given problem and can rob you of time needed for the other problems. For example if you expand the determinate below by column 3, you will be able to factor the resulting polynomial, but if you expand by row 1 you will get an ugly cubic:  $p(\lambda) = -12 - 5\lambda + 6\lambda^2 - \lambda^3$  instead of  $(4 - \lambda)(\lambda^2 - 2\lambda - 3)$

$$p(\lambda) = \det \begin{bmatrix} 1 - \lambda & 2 & 0 \\ 2 & 1 - \lambda & 0 \\ 2 & -3 & 4 - \lambda \end{bmatrix}$$

Finally you need to show all your steps for full credit.

- Lab Format. Early problems are on-line; later problems require hardcopy. The hardcopy needs to be your **OWN** work, written in clear English. Neatly typed or written in ink on one side of standard 8.5 by 11 paper. Multiple pages must be stapled and **NOT** dog-eared or paper clipped. **Labs with a paper clip or with dog-eared pages will receive a zero score.** You are expected to edit scilab output. There should be no false starts, nor unneeded output. Discussion about the lab or homework problems with other students or the professor is permissible and even encouraged, but the final output needs to be uniquely yours and not obtained by copying from another's solution. All labs must be submitted in hardcopy. No electronic copies will be accepted. (But if you are having problems with graphics, I will look at a PDF file.)
- See your main MAP 3305 syllabus for the standard statements on Honor code and ADA.