Pearson

Engineering Computation with MATLAB Review

David Smith

REVIEWER INFORMATION

Department: _____School of Informatics, Computing, and Cyber Systems_____
School: _____Northern Arizona University, Flagstaff, AZ_____

COURSE INFORMATION

Course Title: ___CS122 Programming for Engineering and Science_____ Grade Level: ___Freshman-level college class_____

Annual Enrolment: __700_____

Text in Use: ___MATLAB Programming for Engineers, 5/e, Stephen Chapman, Cengage (2016)_____

Pearson

Engineering Computation with MATLAB Review

David Smith

1. What factors made you chose your current book?

Predecessor had chosen it, so, I just chose newest edition. It comes with substantial instructor materials (key factor for me in choosing a text, as I have large class sizes).

2. How does this book compete with your current text?

Biggest weakness of my current text is that it dives into MATLAB syntax without giving the student an introduction to computers and problem solving, so, I am forced to hold off on the text the first two weeks and do my own problem solving, algorithmic thinking, heuristics etc. before I can have them open the Chapman book. Dr. Smith's book solves that problem with a nice introduction to computers and computing --- my student needs that desperately. For Dr. Smith's next revision, I would suggest putting some of his Chapter 10 Principles of Problem Solving earlier, maybe even as early as Chapter 2.

3. Please examine the table of contents of *Engineering Computation with MATLAB* and answer the following:
    a. How does the Table of Contents match with your current course syllabus? Please elaborate.

Here are my syllabus topics:
Week 1 Algorithmic thinking and problem solving
Week 2 Algorithmic thinking (concluded)
Week 3 MATLAB - introduction and basics
Week 4 Vectors and matrices
Week 5 2D plots. Math stats and conditionals.
Week 6 Branching statements & program design
Week 7 Loops and vectorization
Week 8 Basic user-defined functions
Week 9 Advanced features of user-defined functions
Week 10 Strings
Week 11 Input/output
Week 12 Complex numbers and 3D plots
Week 13 Importing data
Week 14 Binary and hex number systems
Week 15 Intro to computer systems. Course review.

I feel I jump around a bit, in comparison to Dr. Smith's text.

    b. Would you change the order of chapters? If so, how?

Actually, I would follow more closely Dr. Smith's book. He has a nice order of MATLAB topics in order of increasing complexity (a good thing!). This book review had made me rethink my class.

c. Do you, or have you, used this text for more than one course? Please explain.

I have not seen Dr. Smith's book until I performed this book review. I have 3 sections of about 110 students each, with about 8 40-person lab classes. The students definitely need a course text as a reference document. Chapman's book has problem sets, but I like Dr. Smith's programming projects better. Hopefully solutions are available within an instructor companion website.

2. Please comment on the quality of the book's pedagogy. Are there pedagogical elements in other books you have used that you feel should be incorporated into this text? What are they?

I really like these things: the engineering problem examples with programming projects at the end of each chapter, and the self-test review quizzes with answers in Appendix D. Those self-tests are a nice touch to reinforce concepts. I also love the "style points" as a way to introduce related, coding style concepts or alternative solutions.

3. How well does the author present the material in terms of readability, clarity, etc.?

Very clearly written. For me, the order of topics/chapters is key, and Dr. Smith has done a nice job of this.

4. Which topics in your course present you with the greatest teaching challenge? How does this text handle these topics?

My present class has this major challenge --- students have not had any computing pre-requisite, so, I am often teaching them basic computer and file management operations. Fortunately, I have lab classes with lab aides that can spoon-feed those steps to students new to programming. This text presents complicated concepts in a lucid, non-complicated manner.

5. Are there other topics that you would suggest deleting or shortening?

Can't think of any. The book is quite comprehensive. There is one example of music CD's in Chapter 7, so, Dr. Smith will need to update that example to be more closely aligned to Millennial music listening habits given current audio technology.

6. Are there topics that you would suggest expanding?

Can't think of any.

7. How do you find the quality of the examples? Are there too many or too few?

Just right. My students seem to like "drawing" the 2D plots, 3D plots, graphs, etc., and Dr. Smith has really nice examples of these.

8. Do you find that the problems are sufficient? Do they relate well to the material?

It is fine as is.

9. How do you find the quality of the illustrations and photos? Are there too many or too few?

See #7 above. My students always like the images (a picture is worth 1000 words). Love Chapter 13 on how MATLAB works with images. Wish Chapter 13 was in color, but I understand it probably would make the book more expensive, less cost competitive.

10. When considering the adoption of a new edition, what kinds of revisions are most important to you? For example, new problems, new examples, up-to-date references, etc.

MATLAB is a moving target with releases virtually annually from Mathworks (vendor). Just make sure the content is not release-specific. I tend to gravitate towards books that have comprehensive instructor materials, e.g. solution sets, even on-line class tools, e.g. MyITLab.

11. What supplements do you use in teaching your course? Which would you like to see provided with this text and why? Specifically, are there any particular digital supplements that you would like to see included?

Same answer as #10 above

12. Do you utilize online homework in your course? In your opinion, do you think online grading of programming homework would be a useful tool to accompany this text?

Yes, please. I have huge class sizes and on-line course materials and on-line grading off-loads me tremendously. We use Blackboard Learn as a course management system.

13. In your opinion what are the best features of this text?

The prioritization/order of topics is important to me, and this text meets that requirement. Also, I like the “comfortable” writing style with style tips, figures, self-quizzes, code examples, and engineering examples.

Please provide any additional comments you may have below.

Very nice book. Please advise of some of the instructor companion materials (e.g. solutions, e.g. MyITLab) are available.