Importance of MATLAB in engineering

There has been a significant shift in engineering from in-lab experiments and testing to numerical simulations. In order to run such simulations one needs to have a solid set of computational skills. This is the base for very important fields in engineering such as finite element analysis which covers a wide range of topics from stress-strain analysis in structures and machines to thermal analysis and theoretical models that represent specific physical phenomena.

I try to transmit this fact to my students along with the idea that MATLAB can help them with other courses in their degree. They can use MATLAB to check for equation solutions, integrations, derivations and to optimize results in design problems that involve multiple varying parameters. They can also use it in their laboratory classes to process experimental data and to make plots to visualize experiments and extract conclusions.

When I teach MATLAB to students who have not used it before, I try to maintain an active class by giving them multiple exercises and letting them to work under my supervision. I try to provide feedback on an individual basis as much as I can since everyone has its own way of writing code. The exercises I create for them are of a practical nature. For example, I have them calculate taxes, manage small inventories for a store, calculate mathematical series, solve electrical circuits, or play the game hangman.

I try to challenge them with homework problems and encourage them to practice at home since similar to a sport practicing your coding is absolutely essential to get better at it.