

# Chapter 7

## Epilogue

The world of science changed our lives from the 17th century. The science revolution has brought a culture of scientific thinking through parameterization of Physics that we have been observing over millennia. It brought us the realm of engineering directly to our doorsteps. Industrial revolution became a reality. Initially design remained to deal with engineering practice and testing and with the advent of rotating machinery at the turn of 20th century when analytical design became a necessity. Unfortunately we did not have computational capabilities beyond using logarithmic tables and hand calculations.

Therefore the 15 coupled partial differential equations of solids were simplified drastically to one dimension and approximate methods were evolved to get along with the design of rotating machinery and supporting structures by using a correction factor (Factor of Safety) to account for the approximations.

This scenario changed once high performance computing became common. This has brought back fundamental tenets of scientific revolution over three centuries. Yet many educational institutions continue to emphasize the century old approximations rather than the current industrial practices. This has meant that the commercial codes are just tools and very rarely engineers of the day know what happens in a code. The codes are merely replacing log tables or slide rules of yester year, using the same science, more accurately rather than through approximations.

This book brings out an approach which directly brings science to the fore that makes the young mind understand what the commercial codes are doing and bring students to current engineering practices more intelligibly; Simulation Based Engineering Science (SBES) Approach.