

## **An Assessment of Utilizing Computer Software in Introductory Thermodynamics Courses**

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### **Abstract**

In recent years many textbook publishing companies have been providing optional computer software for engineering textbooks. Some of these software packages are tools for enhancing classroom instruction and others are capable of engineering analysis. In teaching thermodynamics and heat transfer courses for over twenty years, the author has integrated interactive computer software into his courses. *Interactive* computer programs are currently available as an option with engineering textbooks in both thermodynamics and heat transfer. They are extremely useful tools in analysis and design in introductory courses. The most significant advantage of these software programs is that no prior knowledge of programming language is necessary in their applications. These software programs are general purpose, nonlinear equation solver with built-in property functions. The software is capable of exploring and graphing the effects of change of parameters within the problem. In addition to the built-in functions, the users with some computer programming background can create their own functions to be used in equations in the workspace.

This paper will discuss the benefits and drawbacks associated with the use of computer software in introductory thermodynamic courses. It will provide a comparison of the available software and highlight the strength and limitation in each case. It will describe how one of these software programs has been integrated into the thermodynamics course sequence in our undergraduate mechanical engineering program. It will also provide a short introduction to use of the software. Finally it will present examples of its application to engineering analysis and design of thermodynamic systems.