The primary objectives of this project was to construct and develop online assignments and electronic educational tools for Chemical Engineering 243 (CH-E 243), an introductory thermodynamics course. Sufficient practise is vital in developing the expertise to apply the laws and concepts of thermodynamics to solve complex problems. Therefore, as an important supplement to teaching, an online question database was constructed and stored on the University of Alberta’s ‘Eclass/Moodle’ website. Selected questions from this database were then compiled into assignments/quizzes and assigned to students taking the course as a resource for practise and self-evaluation.

Eleven online assignments were constructed during this project. The assignments are constructed as more of an educational resource for students, rather than a tool for grade distribution. As it provides students with the feature of immediate feedback and multiple attempts. The online assignments are composed of questions such as Multiple Choice, True & False and Numerical Response that thoroughly tests students on the key concepts taught in this course. Moreover, five different versions to each numerical response question was generated, each with different initial values to prevent cheating and to promote the importance of practise. The numerical response questions allows for just enough tolerance in the final answer to ensure that the correct conceptual methods had been incorporated by students when solving for the particular problem. In addition, detailed solutions to all eleven assignments had been constructed. These solutions emphasize the conceptual significance of each step of the method used to determine the final answer, and serves as a resourceful study guide for students taking the course.

The online assignments provides a free platform for students to be able to practise and consequently gain expertise and command over thermodynamics. The online assignments will also prove to be a valuable tool for the further development of CH-E 243, as the questions comprising the online assignments may be altered with some changes to numerical values, and reused for future assignments in subsequent academic terms.