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Addressing the Liberal Arts in a Core Engineering Class: Theology, Philosophy, Social
Ethics and the Second Law of Thermodynamics

Abstract
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Can an engineering professor address theological, philosophical, and social issues in a core engineering class in a way that is relevant to the core content of the class? Our answer is yes. The authors have been addressing such issues for more than a decade in an introductory thermodynamics class required of all students in the general engineering program at Geneva College. Geneva's mission encourages faculty members to develop such linkages between faith, the liberal arts, scientific theory, and professional practice. The first author developed a term paper assignment about a decade ago requiring students to "consider the development of technology in terms of entropy and the second law of thermodynamics" in the light of biblical teaching and requiring them to consider how their conclusions would "influence their career choice and professional activities."

The second author began teaching the course five years ago and modified the assignment, focusing the students somewhat more narrowly on specific theological and philosophical positions that can be or have been taken regarding the second law. In the most recent version of the assignment, the students were required "to formulate and defend a thesis that relates entropy or the increase of entropy principle to one or more of the concepts" given in the following list: creation, stewardship of creation, the fall, evolution, pollution, and eschatology.

The authors have found that students are stimulated by this assignment to reflect on the meaning of entropy and the second law and on the implications of the second law beyond the analysis of typical engineering systems and devices. Some students are able to clarify their thinking and even modify their initial unreflective views of the second law by means of this assignment.

Most institutions have something in their mission statements supporting efforts to help students think about the social and/or environmental implications of their professional work. Students can perceive that the second law is relevant to such issues and that the technical knowledge of thermodynamics that they are gaining in an engineering class gives them a special perspective on these issues.