



Discovering the role of engineering in the world: a new teaching experience focused on New York City and civil engineering

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Abstract

“Engineering in the modern world” is a Princeton University course taken by engineers and non-engineers. It explains how engineering has shaped culture and society and how engineering innovations have been influenced by social, scientific, political, ethical, and aesthetic requirements. Engineering is understood in a broad sense that includes structures, machines, networks and processes. The course uses several methodologies such as master lectures, seminars and labs. This paper explains a new approach followed in one of the seminar groups. A group was created that focused on the role of civil engineering in shaping New York City (NYC) and delved into the relationships between engineering, society, politics and aesthetics in selected NYC’s works. The paper presents the teaching methodologies used during the seminar and discusses the success of the new approach.

Keywords: engineering; politics; society; aesthetics; New York City.

1 Introduction and objectives

“Engineering in the modern world” is a course developed at Princeton University by professors D.P. Billington and M. Littman. The course explains how engineering, culture and society are related. Engineering is analyzed using historical analysis and is considered in a broad sense that includes bridges, railroads, power plants, highways, airports, automobiles, aircraft, computers, and the microchip. During the course, students attend master classes, either seminars or labs and solve, using simplified formulations, sets of problems related to the topics covered by the course. The

course, aimed at freshman engineering students and liberal arts students interested in learning about technology, has no prerequisites and is not a specific preparation for other courses on engineering.

This paper explains a new approach followed in one of the seminar groups. A typical seminar group analyzes writings related to selected innovations in the main branches of engineering (civil, mechanical, electrical, aerospace and chemical) throughout the United States. The new seminar group studied the role of civil engineering in shaping New York City (NYC), and delved into the relationships between engineering, society,