

## Overview of the Civil and Geotechnical Engineering Disciplines

*Note: For additional information and resources concerning technical writing and civil engineering, please visit the URL <http://filer.case.edu/her6/ENGL506/index.html>*

### **Civil Engineering:**

Civil engineers design, build, and maintain infrastructures such as bridges, levies, dams, canals, transportation systems, waste/water treatment facilities, industrial plants, buildings, etc. Or as one professional engineer put it “Engineers do everything society takes for granted until it goes wrong.”

### **Geotechnical Engineering:**

Geotechnical engineering is a sub-discipline of civil engineering that analyzes the physical, mechanical and chemical properties of “earth materials (i.e. soil, subsoils, rock). Based on this analysis, geotechnical engineers determine the safest, longest lasting, and, hopefully, most environmentally equitable foundational designs. Additionally, geotechnical engineers assess risks posed by earthquakes and floods.

Both civil and geotechnical engineers value effective written communication skills because engineers need to communicate important technical information to a variety audiences. In addition, strong communication skills help engineers voice their current concerns with sustainable design and infrastructure rehabilitation.

## Selected Journals and Societies

### **Soil Dynamics and Earthquake Engineering**

As the title suggests, *Soil Dynamics and Earthquake Engineering* explores the role of geotechnical engineering in earthquake risk assessment and prevention.

### **International Journal of Geomechanics**

This journal focuses primarily on theoretical concepts within geomechanical/geotechnical engineering

### **Civil Engineering Magazine**

This magazine is an excellent source for non-engineers seeking to understand general engineering activities and concerns.

### **ASCE**

This is the cornerstone professional organization for civil engineering and its sub-disciplines.

## Selected Writing Resources

### **The McGraw-Hill Dictionary of Scientific and Technical Terms 6<sup>th</sup> Edition**

As McGraw-Hill's website notes, "this resource provides definitions written in clear, simple language, understandable to the general reader, yet consistent with the specialized usage of the term."

### **The MIT Guide the Science and Engineering Communication**

This writing guide stresses the importance of audience and purpose analysis for technical writing.

### **Penn State online Engineering Writing Guide**

<http://www.writing.engr.psu.edu/>

This comprehensive and user friendly technical writing resource includes lesson plans, power point presentations, handouts, example engineering genres, and many other resources.

## Brief Annotations of Selected Engineering Genres

### **Proposals**

There are two types of proposals: solicited and unsolicited. Proposals are called *solicited* when a grant agency or sponsor announces that funding is available for a specific problem or area. Unsolicited proposals are proposals that identify a previously overlooked area/problem/concentration *and* request funding for the study. Engineers use proposals primarily to *persuade*. As such, studying the rhetorical nature of this genre might be a useful activity for engineering students.

### **Lab Reports**

The lab report usually chronicles how an experiment or project was conducted. As such, lab reports usually have a standard format, although not all experiments conform to a standardized organization. Lab reports typically include an abstract, introduction, methods, results/discussion, conclusions, and appendices. Stylistically speaking, lab reports need to be concise and accurate. Consequently, studying this genre's stylistic and formal features might help engineering student's produce better written work.

### **Design Report**

A design report is a genre often used within the professional sphere of engineering. Design reports often describe the processes or "science" behind the design as well as provide a rationale for the design. These reports are often read by engineers and non-engineers. Again, studying audience and rhetorical concerns within the context of the design report will help engineering students communicate more effectively.