Spring 2022

EE 590

Scientific Research Methods and Ethics for Engineers

Syllabus

Meeting times	: Friday 9:45, 10:45
Text	: E. Bright Wilson Jr., "An Introduction to Scientific Research," Dover Publications; Rev Sub edition (1991), Charles B. Fleddermann, "Engineering Ethics," Pearson; 4th Edition (2011)
Instructor	: Bilge Karaçalı, PhD

Summary:

This course will investigate the application of the scientific method to the scientific research practice in electrical and electronics engineering and the ethical concepts applicable to the publication practice during and after these research processes. After the scientific method is presented to the students along with its applications in various disciplines, the methods followed in the scientific research projects within the specific field of electrical and electronics engineering will be explained within a framework of matters pertaining to project proposal preparation, submission of progress and final reports and publication of the obtained findings. Afterwards, science, publication and engineering ethics concepts including privacy of personal information, efficient use of resources and plagiarism in relation to both processes of conducting scientific research and publication of findings will be introduced.
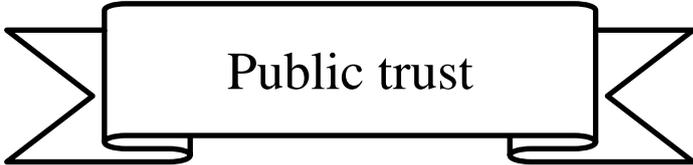
Course Outline:

Week 1   Course introduction, syllabus, assessment
Week 2   The scientific method
Week 3   Project proposal writing
Week 4   Technical report and scientific paper writing
Week 5   Engineering ethics
Week 6   Scientific research ethics
Week 7   Case studies – Excellence by Nonsense
Week 8   Case studies – Henrietta Lacks
Week 9   Case studies – Chernobyl disaster
Week 10   Case studies – Challenger disaster
Week 11   Case studies – An authorship scenario
Week 12   Case studies – A safety scenario
Week 13   Case studies – A conflict of interest scenario
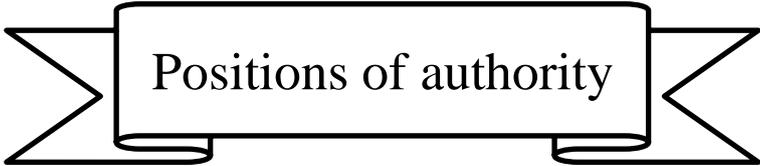Week 14   Case studies – A confidentiality scenario

Grading:

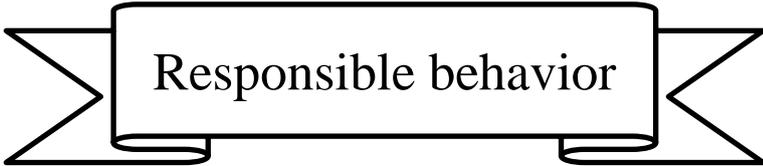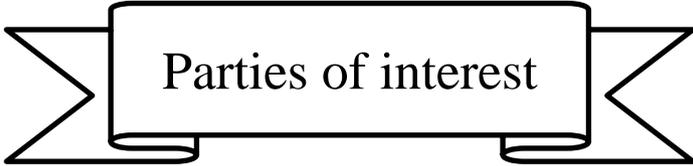|	
Class Participation	20%
Project	40%
Final	40%

Concepts Linked to Matters of Ethics

Public trust
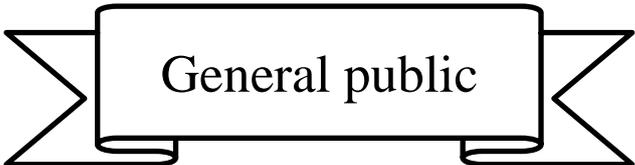
Positions of authority

Responsible behavior

Parties of interest

Professional societies

General public