

ESG 217: Engineering Science Design I (Required)

Course Catalog description:

An introduction to the philosophy of engineering design, emphasizing the integration of problem-solving techniques with choices of available technology and materials in order to respond to a particular human need. Engineering ethics are also examined from both historical and decision-making perspectives. Basic science of design, including system viability and project management, is discussed through examples, flowcharts, and optimization techniques with an emphasis on design for manufacturing and reliability.

3 credits

Pre- or Corequisite(s):

None

Text(s) or other required material:

"Engineering by Design", 2nd edition, by Gerard Voland with associated website at:

<http://www.etc.ipfw.edu/~voland>

Handouts on design, quality control and failure analysis. The course will also use guest lecturers and a number of real-world examples provided throughout the semester.

Course learning outcomes: Students gain an understanding of engineering and the requirements needed to make contributions to their chosen career. They learn the importance of lifelong learning, communications skills and the development of technical knowledge necessary to solve engineering problems.

Topics Covered:

Needs assessment
Problem solving in design
Development of specifications
Searching for solutions/intellectual property rights
Modeling and simulations
Synthesis
Midterm test
Ethics
Hazard and failure analysis
Design analysis
Implementation
Materials selection

Class/ Laboratory Schedule, i.e. number of sessions each week and duration of each session:

ESG	217	Engineering Science Design I	LEC	1	TUTH	6:50 PM	8:10 PM
			REC	R01	RECF	11:45 AM	12:40 PM
			REC	R02	RECF	12:50 PM	1:45 PM

Contribution of Course to meet requirement of Criterion 5: The course discusses the full range of introductory design concepts from problem formulating, assessing a solution to a problem and developing a solution to that problem, and finally implementing the solution.

Relationship of course to program outcomes: By the time the student is finished with the course, s/he will understand how to utilize the vast wealth of technical knowledge available. S/he will have worked in a team environment to evaluate and solve engineering design problems and had performed evaluations and analysis of various designs.

Person(s) who prepared this description and date of preparation: Frank Szalajda, PE-course instructor.6-14-09