

Environmentally Responsible Design & Manufacturing

Instructor

Dr. John W. Sutherland	Kiran Kkadke & Karl Haapala
Office: 803 MEEM	401 C MEEM
Phone: 906-487-3395	906-487-3396
Fax: 906-487-2822	906-487-2822
email: jwsuther@mtu.edu	knkhadke@mtu.edu & krhaapal@mtu.edu
Office hours: Any time	following class

Course website accessible from: <http://www.me.mtu.edu/~jwsuther>

Grading

Homeworks: 30% (25%), Midterm: 30% (25%), Final: 40% (30%)

Graduate Project: (20%)

Over-all GPA for class of about 3.0

Course Text & Other References

1. Graedel, T., and B. Allenby, Design for Environment, Prentice-Hall. (Course Text)
2. Toward a Sustainable Future: Addressing the Long-term Effects of Motor Vehicle Transportation on Climate and Ecology, Spec Report by Trans Res. Board of the NRC, 1997.
3. Brown, L., C. Flavin, S. Postel, Saving the Planet, W. W. Norton & Co., 1991.
4. Handbook of Environmentally Conscious Manufacturing, C. Madu ed., Kluwer Acad., 2001.
5. Graedel, T., Streamlined Life-Cycle Assessment, Prentice Hall, 1998.
6. Graedel, T., and B. Allenby, Industrial Ecology, Prentice-Hall, 1995.
7. Graedel, T., and B. Allenby, Industrial Ecology and the Automobile, Prentice-Hall, 1998.
8. Office of Technology Assessment - U.S. Congress, Green Products by Design, 1992.
9. Plus handouts and web links posted on the course webpage.

Course Topics

Introduction

Environmental measures (Global -- Local)
Sustainability
Laws & Regulation
Control vs. ?
Motivators

Process Design

Types & Wastes
Process Impacts and how to measure them
Plant Issues
Input-Output Analysis
Supply Chain Issues

Product Design

Life Cycles
Materials
Assembly & Disassembly
QFD
DFX

System Issues & Industrial Ecology

System Modeling
Life Cycle Analysis
Risk Assessment and Management
Decision Making
Future Steps