

**Perfusion Biomaterials Course Outline
PE-645, Spring '10**

Textbook Ratner, B., A. S. Hoffman, F. J. Schoen and J. E. Lemons, Eds. Biomaterials Science, 2nd ed. Elsevier, 2004.

References: Sharma, Chandra P. and Michael Szycher, Eds. Blood Compatible Materials and Devices. Perspectives Towards the 21st Century. Technomic, 1991.
Park, Joon B. and Roderic S. Lakes. Biomaterials -- An Introduction, 2nd ed. Plenum Press, 1992. (optional supplementary)

Lecture: W 5:00 to 7:40 (with 10 minute break) S-366

Course Home Page: <http://www.msoe.edu/~tritt/pe645/index.html>

Course Policies: <http://people.msoe.edu/~tritt/policies.html>

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Office Hours: Office Hours: 9:30 to 11:00 M & Tu and 2:00 to 4:00 W & Th. I'll be on campus from 9:00 to 4:00 most days so feel free to stop by my office. Also, don't hesitate to use Outlook to request to meet with me at a specific time.

Lecture and Reading Schedule (sessions divided into 75 minute blocks)

| Week | Topics and reading assignments (in Ratner) |
|------|--|
| 1 | Introduction and Surface Characterization (Preface & Sec. 1.4 & 5.6 and Handouts) |
| | Material Properties (Sec. 1.2 & Handouts) |
| 2 | Metals. Term paper topics selected (Sec. 2.9 and Handouts). |
| | Ceramics, Glasses (Sec 2.10 & 2.11 and Handouts). Discussion of thesis topics. |
| 3 | Polymers (Sec. 2.2, 2.3, 2.5 & 2.6 and Handouts) |
| | Polymers, continued. |
| 4 | Fabrics, Composites and Films (Sec. 2.4 & 2.12 and Handouts). Discussion of thesis topics. |
| | Midterm. |

| Break Week | |
|-------------------|--|
| 5 | Proteins, Cells and Tissues (Sec. 3.1, 3.3, 3.4 & 3.5) |
| | Natural Materials (Sec. 2.8 and Handouts) |
| 6 | Surface Properties and Adsorption (Sec. 4.6 & 5.4 and Handouts) |
| | Wound Healing and Host Response (Sec. 4.1 to 4.4) |
| 7 | Tissue Engineering in Perfusion (Sec. 8.1 & 8.2 and Handouts) |
| | Hemocompatible Coatings. Testing of Biomaterials (Chapter 5) |
| 8 | Biodurability and Degradation of Biomaterials (Chapter 6) |
| | Probable Midterm II. |
| 9 | Student Presentations |
| | Biomaterials Implications of Sterilization Techniques (Section 9.2 and Handouts) |
| 10 | Poster Session. |
| | Review and Applications (Sections 7.1 to 7.6) |

Approximate Grade Weights

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|---------------------------|-----|
| Participation | 5% |
| Poster & Presentation | 15% |
| Slide Show & Presentation | 15% |
| Midterm | 30% |
| Final | 35% |

The midterm and final will be open book and open notes. This implies that you must understand and be able to explain the material presented rather than simply memorizing it.