**76107 – Tissue Engineering**

*Thursdays, 12:00 to 14:45 PM*

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**Syllabus**

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| 28-Feb-13 | 1 | Introduction: definitions, basic principles, structure-function relationships |
| 7-Mar-13 | 2 | Biomaterials: metals, ceramics, polymers (synthetic and natural). Biodegradable materials, native matrix |
| 14-Mar-13 | 3 | Tissue culture basics: primary cells vs. cell lines, sterile techniques, plastics, enzymes, reactors and cryopreservation |
| 21-Mar-13 | Passover | No class |
| 28-Mar-13 | Passover | No class |
| 4-Apr-13 | Passover | No class |
| 11-Apr-13 | 4 | Oxygen: diffusion, Michalies-Menten kinetics, oxygen uptake rates, limits of diffusion |
| 18-Apr-13 | Abroad | No class |
| 25-Apr-13 | Abroad | No class |
| 2-May-13 | 5 | Principals of self assembly: cell migration, 3D organization and angiogenesis |
| 9-May-13 | 6 | Skin tissue engineering: introduction, scar vs. regeneration, split skin graft, apligraf |
| 16-May-13 | Shavot | No class |
| 23-May-13 | 7 | Cardiovascular tissue engineering: introduction, blood vessels structure, vascular grafts |
| 30-May-13 | 8 | Liver tissue engineering: bioartificial liver (BAL) assist device, shear forces , oxygen transport, plasma effects  |
| 6-Jun-13 | 9 | Liver tissue engineering: self-assembled organoids, decelluarized whole livers |
| 13-Jun-13 | 10 | Advanced concepts in tissue engineering: 3D printing, decellularization, BioMEMS |
| 20-Jun-13 | 11 | Take Home Exam |

**Final Grade**

40% class participation, 30% homework, 30% final exam