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Tissue Engineering

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Description: Tissue engineering is an interdisciplinary field that applies the principles of engineering and life sciences toward the development of biological substitutes that restore, maintain, or improve tissue function or whole organs. Typically scaffolds, cells, and biologically active molecules are combined to form or repair functional tissues. The goal of tissue engineering is to assemble functional constructs that restore, maintain, or improve damaged tissues or organs. Applications can be in vitro (e.g., "organs on a chip") as well as in vivo (e.g., "regenerative medicine").

Guide for class selection: Any three courses from the list below may be taken to satisfy this concentration.

Restricted Electives

20.205 **Principles and Applications of Genetic Engineering for Biotechnology and Neuroscience** (U) same as 9.26J
Prereq: 7.28, 7.32 or 20.020, 9.01 or 9.09

20.310 **Molecular, Cellular and Tissue Biomechanics** (U) Spring
Prereq: Biology (GIR), (2.370 or 20.110[J]), and (3.016B or 18.03)

20.352 **Principles of Neuroengineering** (U)
Prereq: Permission of instructor

20.361 **Molecular and Engineering Aspects of Biotechnology** same as 7.37J, 10.441J
Prereq: 2.005, 3.013, 5.60, 20.110, or 20.111; 7.06; or permission of instructor

20.363 **Biomaterials Science and Engineering** (U) same as 3.005J
Prereq: 3.034, 20.110, or permission of instructor

20.375 **Applied Developmental Biology and Tissue Engineering** (U) meets with 20.475
Prereq: 7.06, 20.320, and 7.02 or 20.109; or permission of instructor

2.782/HST.524 **Design of Medical Devices and Implants** (G) Spring
Prereq: (Biology (GIR), Chemistry (GIR), and Physics I (GIR)) or permission of instructor

2.787/HST.535: **Tissue Engineering and Organ Regeneration** (G) Fall
Prereq: (Biology (GIR), Chemistry (GIR), and Physics I (GIR)) or permission of instructor

2.796/6.522 **Quantitative Physiology: Organ Transport Systems**
Prereq: 6.021[J] and (2.006 or 6.013) (G) Fall

7.20 **Human Physiology** (U)
Prereq: 7.05