Syllabus

Instructor: Shu Q. Liu
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Time: Spring quarter
Tuesdays, Thursdays 11:00AM - 12:20PM

Location: TBD

Office hours: 3:00 am – 4:00 pm, Thursdays (E327 Tech)

Prerequisites: BMD ENG 349-1 Regenerative Engineering Principles and Technologies

Course Objectives:

1. Understand the pathogenesis, pathology, and pathophysiology of genetic and environmental factor-induced human disorders.
2. Recognize the necessity of engineering components in regenerative medicine.
3. Application of regenerative engineering principles and technologies to human disease.

References:


Evaluation:

1. Quizzes (weekly): 20%
2. Homework assignments (weekly): 20%
3. Midterm: 20%
4. Final: 30%
5. Design project: 10%

Lectures:

I. Fundamental Concepts
   1. Engineering aspects of regenerative medicine
   2. Genetic human disorders
   3. Environmental factor-induced human disorders
   4. Innate protection, repair, and regeneration in human disease
   5. Principles of engineering-based treatment of human disease

II. Nerve system
   6. Traumatic brain injury
   7. Spinal cord and peripheral nerve injury
   8. Stroke
   9. Alzheimer’s disease
10. Parkinson’s disease

Midterm

III. Visual system
   11. Corneal injury
   12. Glaucoma

IV. Cardiac system
   13. Heart attack
   14. Valvular heart disorders

V. Vascular system
   15. Atherosclerosis
   16. Aneurysm

VI. Other systems
   17. Liver injury and cirrhosis
   18. Diabetes
   19. Kidney injury
   20. Skin injury
   21. Bone injury

Final