

## BME 362 / ELE 562 Suggested Topics

1. Next generation DNA sequencing machines – review of the current status and products under development.
2. Toxicity of bionanomaterials such as carbon nanotubes, quantum dot, and gold nanoparticles.
3. Review of products and clinical applications of tissue engineering.
4. Organ printing.
5. Tissue-engineered cartilage.
6. Tissue-engineered skin.
7. Antioxidants such as NAC, PQQ, and coQ10 – How do they help preventing the formation of coronary artery stenosis?
8. Persistent organic pollutants.
9. Research on the possible role of stem cells in the formation of coronary artery stenosis.
10. Review of coronary artery stent.
11. Extracorporeal membrane oxygenation (ECMO).
12. Artificial lung.
13. Abiomed Impella – a catheter-based heart pump.
14. Proton beam therapy – technology, products, cost for machine and treatment, ethics.
15. AccuVein AV400 vein illumination system – technology, patent (?), clinical applications, cost for machine and treatment.
16. Powered prosthetic knee.
17. Powered prosthetic angle.
18. Robotic surgeries (other than the Da Vinci system).
19. Argus II retinal prosthesis system.
20. Artificial nose technology – perhaps including a review of the olfactory system.
21. Tactile sensory system and tactile transducers for sensory substitution.
22. Cochlear implant.
23. Digital hearing aid.
24. LASIK surgery, especially the longer-term, follow-up studies.
25. Cataract surgery and lens implant.
26. Glaucoma tests (intraocular pressure measurement).
27. Current status of noninvasive glucose monitoring.
28. Latest technologies on hip replacement.
29. Latest technologies on knee replacement.
30. Targeted muscle reinnervation.
31. Tooth implants.
32. Transcranial magnetic stimulation.
33. Heart rate variability.
34. Current status of hemodialysis (artificial kidney).
35. Artificial urinary sphincter for urinary Incontinence.
36. Seizure detection.
37. Brain stimulation therapy for seizures.
38. Brain stimulation therapy for Parkinson's disease.
39. Brain stimulation therapy for Depression.
40. Treatments of sleep apnea.
41. Contraception technologies.
42. Assisted reproductive technology.