Biomedical Engineering

**BMEN 6341** Biostatistics (3 semester hours) Introduction to probability; joint, marginal and conditional distributions; entropy and relative entropy (Kullback-Leibler divergence); Markov processes and hidden Markov models; applications to specific problems such as sequence alignment, analysis of gene expression data and protein classification. (3-0) T

**BMEN 6351** Biomedical Microdevices (3 semester hours) Introduction to concepts of medical microdevices; design methodology and its applications for diagnostics and therapeutics. (3-0) Y

**BMEN 6355 (MSEN 6355)** Nanotechnology and Sensors (3 semester hours) Introduction to the concept of nanotechnology, in context toward designing sensors/diagnostic devices. Identifying the impact of nanotechnology in designing "state-of-the art" sensors for healthcare applications. Topics include: nanotechnology and nanomaterials, principles of sensing and transduction and heterogeneous integration toward sensor design. (3-0) Y

**BMEN 6372 (MECH 6314, SYSM 6306)** Engineering Systems: Modeling & Simulation (3 semester hours) This course will present principles of computational modeling and simulation of systems. General topics covered include: parametric and non-parametric modeling; system simulation; parameter estimation, linear regression and least squares; model structure and model validation through simulation; and, numerical issues in systems theory. Techniques covered include methods from numerical linear algebra, nonlinear programming and Monte Carlo simulation, with applications to general engineering systems. Modeling and simulation software is utilized (MATLAB/SIMULINK). (3-0) Y

**BMEN 6373 (EEBM 6373)** Anatomy and Human Physiology for Engineers (3 semester hours) This course provides an introduction to anatomy and human physiology for engineers and other non-life scientists. Topics include nervous system, muscle and cardiac function, digestive system, and immune system. (3-0) Y

**BMEN 6374 (EEBM 6374)** Genes, Proteins and Cell Biology for Engineers (3 semester hours) This course provides an introduction to principles of modern molecular and cellular biology for engineers and other non-life scientists. Topics include genes, protein structure and function, organization of cells and cellular trafficking. (3-0) Y

**BMEN 6375** Techniques in Cell and Molecular Biology (3 semester hours) Introduction to cell and molecular laboratory techniques including DNA recombinant technology, protein biochemistry, structural biology, and molecular biology. Intended for engineers and other non-life-scientists. Prerequisite: BMEN 6374 or instructor permission. (3-0) Y

**BMEN 6376 (EEBM 6376)** Lecture Course in Biomedical Applications of Electrical Engineering (3 semester hours) This course provides an introduction to different areas of biomedical applications of electrical engineering. A special emphasis will be placed on research topics that are actively pursued at UTD. (3-0) Y

**BMEN 6377** Introduction to Protein Engineering (3 semester hours) Development of proteins with practical utility will be discussed, using examples and case studies taken from the current literature. Prerequisites: BMEN 6374 or by instructor permission. (3-0) Y

**BMEN 6380 (EEBM 6380)** Introduction to Cellular Microscopy (3 semester hours) Image formation, diffraction, labeling techniques, fluorescence and image processing techniques will be introduced. (3-0) Y

**BMEN 6381 (EEBM 6381)** Advanced Concepts in Microscopy (3 semester hours) Continuation of **BMEN 6380**, with emphasis on advanced approaches such as vectorial diffraction, stochastic aspects of image formation and analysis. Prerequisites: BMEN 6380 or EEBM 6380 or by instructor permission. (3-0) Y
BMEN 6v40 Individual Instruction in Biomedical Engineering (1-9 semester hours) (May be repeated for credit). ([1-9]-0) R
BMEN 6v70 Research in Biomedical Engineering (3-9 semester hours) (May be repeated for credit). For pass/fail credit only. ([3-9]-0) R
BMEN 6v71 Seminars in Biomedical Engineering (1-9 semester hours) (May be repeated for credit). For pass/fail credit only. ([1-9]-0) R
BMEN 6v87 Special Topics in Biomedical Engineering (1-9 semester hours) (May be repeated for credit). ([1-9]-0) S
BMEN 6v98 Thesis (3-9 semester hours) (May be repeated for credit). For pass/fail credit only. ([3-9]-0) S
BMEN 7v87 Special Topics in Biomedical Engineering (1-9 semester hours) (May be repeated for credit). ([1-9]-0) S
BMEN 7v88 Seminars in Biomedical Engineering (1-9 semester hours) (May be repeated for credit). ([1-9]-0) R
BMEN 8v40 Individual Instruction in Biomedical Engineering (1-9 semester hours) (May be repeated for credit). ([1-9]-0) R
BMEN 8v70 Research In Biomedical Engineering (3-9 semester hours) (May be repeated for credit). For pass/fail credit only. ([3-9]-0) R
BMEN 8v99 Dissertation (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S