The University Curriculum Committee recommends approval of the following:

**Changes in Curriculum**

**Dwight Look College of Engineering**

**B.S. in Biomedical Engineering**

**New Courses**

**BMEN 240. Biosolid Mechanics. (3-0). Credit 3.** Introduction into the mechanics of deformable media important in biomechanics, including biomaterials and biological tissues with an emphasis on mechanobiology and the formation of biological problems within the context of 1) kinematics including displacements, rotation, strains, 2) the concept of stress, 3) equilibrium, 4) constitutive relations, and 5) boundary conditions. Prerequisite: ENGR 211.

**BMEN 305. Bioinstrumentation. (0-3). Credit 1.** Introduction to biomedical instrumentation design; hands on acquisition of biomedical signals; design, building and testing of bioinstrumentation circuits including analog signal amplifiers and analog filter circuits. Prerequisites: ELEN 214, VTPP 334 and 335; junior or senior classification.

**BMEN 321. Biomedical Electronics. (3-0). Credit 3.** Introduction to biomedical signals; basic circuit analysis for biomedical signals; design of bioamplifier circuits; characteristics of linear and nonlinear circuit elements; design of basic electronic circuits, principles and practice of bioelectronic measurements. Prerequisites: ELEN 214, VTPP 334 and 335; junior or senior classification.

**BMEN 322. Biosignal Analysis. (3-0). Credit 3.** Design and application of analog and digital signal analysis in biomedical engineering; characteristics of biomedical signals; design considerations for analog-to-digital and digital-to-analog circuitry; biosignal transformation methods; analog and digital filter design for biomedical signals. Prerequisites: BMEN 321, VTPP 334 and 335; junior or senior classification.

**BMEN 341. Biofluid Mechanics. (3-0). Credit 3.** Introduction into the mechanics of fluids in biomechanics, including blood, synovial fluid and physiological solutions, with an emphasis on the importance of mechanobiology and the formation of biological problems within the context of 1) kinematics, 2) the concept of stress, 3) linear momentum balance, 4) constitutive relations, and 5) boundary conditions. Prerequisite: BMEN 240; junior or senior classification.

**BMEN 342. Biomaterials and Medical Devices. (3-0). Credit 3.** Selection and use of materials in implantable and tissue contacting medical devices; mass transport in medical devices; regulation and testing of medical devices. Prerequisites: VTPP 335 and BMEN 341; junior or senior classification.
BMEN 420. Medical Imaging. (3-0). Credit 3. The principles of the major imaging modalities including x-ray radiography, x-ray computed tomography (CT), ultrasonography and magnetic resonance imaging; including a brief discussion on other emerging imaging technologies such as nuclear imaging (PET and SPECT). Prerequisite: MATH 251; junior or senior classification.

BMEN 450. Case Studies. (1-0). Credit 1. Examines process through which clinically defined problems are addressed from the perspective of biomedical engineering through the use of case studies; includes issues of technology transfer and clinical evaluation. Prerequisites: BMEN 240, 305 and 342; junior or senior classification.

BMEN 453. Analysis and Design Project I. (2-0). Credit 2. Group or team biomedical engineering analysis and design project involving statement, alternative approaches for solution, specific system analysis and design. Prerequisites: BMEN 321, 322 and 342; junior or senior classification.

BMEN 454. Analysis and Design Project II. (2-0). Credit 2. Continuation of BMEN 453. Prerequisites. BMEN 321, 322, 342 and 453; junior or senior classification.

BMEN 468. Biothermomechanics. (3-0). Credit 3. Introduction to a continuum thermomechanics approach to quantifying soft tissue behavior in response to combined thermal and mechanical loads including thermoelasticity and thermal damage. Prerequisites: BMEN 240 and 341; junior or senior classification.