

Medical Textiles (MT)

MT 105 Introduction to Medical Textiles (3 credit hours)

Introduction to the structures and methods of production of polymers, fibers, yarns and fabrics used in medical applications. Survey of the performance requirements of current medical textiles and healthcare products used in health centers, as surgical implants and as consumer products. Overview of the structure, organization and integration of the medical textile, medical device and pharmaceutical industries within the healthcare sector. Credit not allowed if previous credit for TT 105

Typically offered in Fall and Spring

MT 323 Introduction to Theory and Practice of Medical Fiber and Yarn Formation (3 credit hours)

Introduction to the manufacture of fibers and filament yarns used in medical textiles. It includes the flow behavior of polymeric materials as it relates to fiber formation. It also includes the application of fiber forming theories to synthetic and biopolymeric fibers used in medical textiles. The common methods of yarn manufacture are introduced.

Prerequisite: (PY 211 or (PY 205 and PY 206)) and (PCC 203 or CH 221 or CH 225 or TE 200)

Typically offered in Fall and Spring

MT 366 Biotextile Product Development (3 credit hours)

Overview of the product development process for medical textiles and implantable biotextile devices. FDA classification system for medical and healthcare products. Review steps in identification of healthcare needs, market size and demand, product specifications and design, prototype fabrication and sterilization, in vitro testing of mechanical, chemical, surface and biological properties, in vivo animal testing, regulatory issues, consumer and clinical trials and explant analysis. Examples of medical textiles for personal hygiene, wound care, external support, orthopedic, general surgery, dental and tissue engineering applications. The student will be introduced to the process of new product development as it applies to medical textiles and biotextiles.

Prerequisite: (TT 105 or MT 105 or PCC 105), (TE 200 or CH 223 or 227), and TT 327: Co-requisite: TT 404, TT 341, and TT 351

Typically offered in Spring only

MT 381 Medical Textile and the Regulatory Environment (3 credit hours)

The course will focus on the legal and regulatory environment as it impacts the design, manufacture, marketing and distribution of medical textiles and healthcare products. Fundamentals of legal theory, contract law, intellectual property, licensing, product liability and the Food and Drug Administration will be covered, providing the student with the ability to recognize and understand the legal issues involved with the medical textile supply chain.

Prerequisite: Junior standing.

Typically offered in Fall and Spring

MT 432 Biotextiles Evaluation (3 credit hours)

Evaluation of the performance of biotextiles and medical polymers in biological and microbiological environments, with an emphasis on in vitro and in vivo techniques for testing the biocompatibility and biostability of implantable biomedical products. Related issues will deal with quality assurance systems, inspection and sampling plans, ISO certification, good manufacturing practices, reference materials and organisms, and the use of accelerated tests and animal trials so as to meet regulatory requirements.

Prerequisite: TT 327 or MT 323 and BIO 183; Corequisite: MT 366 or TE 466

Typically offered in Fall only

MT 471/PCC 471 The Chemistry of Synthetic and Natural Bipolymers (3 credit hours)

Introduction to natural and synthetic biopolymers used for biomedical applications. Goals and challenges of biomaterials selection for biomedical engineering. Polymer concepts of polymerization and characterization. Sources/synthesis, chemical and physical properties and degradation mechanisms are described. Polymer classes include: polysaccharides, proteins, polyesters, polyurethanes, polyanhydrides and polyethers.

Prerequisite: CH 220 or 221 or 225

Typically offered in Spring only