MATE 420/520 Biomedical Materials, 3cr, 3 cl hours
Prerequisites: MATE202 or MATE235 or consent of instructor

This course covers the application of materials in medical devices. Mechanical properties of hard and soft tissues are reviewed. Applications of biomaterials in orthopedics are discussed with emphasis on problems of material-tissue interactions. Other biomedical materials are covered with applications in skin transplants, eye surgery, pacemakers, tissue engineering, and neural prostheses. Host responses are surveyed including adaptation, inflammation, coagulation, foreign body effects, and changes in tissue and organ functions. Methods for biological and clinical testing are highlighted. Regulatory, ethical and business issues are discussed. Students taking the gradual-level course will write an additional report proposing a new solution to an unsolved surgical problem.

Undergraduate Program

Bachelor of Science in Information Technology

Minimum credit hours required — 130

In addition to the General Education Core Curriculum (page 89), the following courses are required:

- CSE 222 (3), 241 (3)
- IT 101 (2), IT 113 (4), 122 (3), 213 (3), 221 (3), 263 (3), 311 (3), 321 (3), 326 (3), 351 (3), 353(3), 373 (3), 382 (3), 481 (3), 482 (3)
- MATH 283 (3)
- PSY 121 (3) (can be applied as a social science course in the general education core curriculum)
- Technical Electives: a sequence of 12 hours of computer science, information technology, or management courses numbered 300 or higher must be *pre-approved* by the student's advisor and an IT Program Coordinator. Students are encouraged to select a coherent set of courses as technical electives that will prepare them for a specific focus in their career.
- Each of the above courses must be completed with a grade of C or better.
- Electives to complete 130 credit hours.

Modify the following course description:

OLD: **IT 353, Data & Computer Communications, 3 cr, 3 cl hrs**
Prerequisites: CSE 222
Basic concepts of data communication. Transmission media (wireline and wireless) characteristics and utilization. Digital and analog data signaling, modulation, and coding. Signal and channel analysis. Concepts from information theory. Data channel multiplexing and subnet switching. Fiber optics networking technology — design and deployment, all-optical-fiber networks, Synchronous and asynchronous carriers (DS, SONET/ SDH). MAC protocols for channel access and allocation. Data link control, design issues, link management, error and flow control. Wireless technology and protocols standards — IEEE 802.11 Terra b/s physical layer & 802.11 MAC sublayer protocols. Overview of the OSI vs. TCP/IP protocol stacks. The Internet protocol structure- "subnet" and interfaces. Examples of LAN, MAN, and WAN. Principles of internetworking: relays and protocols bridges / routers / gateways) and , Introduction to Internet Security and protocols — IPSec; VPN. (Same as CSE 353)

OLD: CSE 353, Data & Computer Communications, 3 cr, 3 cl hrs
Prerequisites: CSE 222

Basic concepts of data communication. Transmission media (wireline and wireless) characteristics and utilization. Digital and analog data signaling, modulation, and coding. Signal and channel analysis. Concepts from information theory. Data channel multiplexing and subnet switching. Fiber optics networking technology — design and deployment, all-optical-fiber networks, Synchronous and asynchronous carriers (DS, SONET/ SDH). MAC protocols for channel access and allocation. Data link control, design issues, link management, error and flow control. Wireless technology and protocols standards — IEEE 802.11 Terra b/s physical layer & 802.11 MAC sublayer protocols. Overview of the OSI vs. TCP/IP protocol stacks. The Internet protocol structure- "subnet" and interfaces. Examples of LAN, MAN, and WAN. Principles of internetworking: relays and protocols bridges / routers / gateways) and , Introduction to Internet Security and protocols — IPSec; VPN. (Same as IT 353)

NEW: IT 353, Introduction to Computer Networks, 3 cr, 3 cl hrs
Prerequisites: CSE 222
Usually offered in the fall semester.
Introduction to computer networking, the ISOOSI protocol stack, LAN, MAN, and WAN. Physical layer: transmission media (wireline and wireless); data signaling, modulation, and coding; multiplexing. Fiber optics networking technology: protocols & examples. Data link Layer: error/flow control-- protocols design issues; MAC protocols for channel access and allocation. Wireless technology and protocols standards-- IEEE 802.11 physical layer and MAC sublayer protocols. Network layer: subnet switching (CS/DG/VC) & routing protocols (Non/Adaptive); Congestion Control and QoS protocols. ISO vs. (TCP-UDP)/IP the Internet protocol stacks. Internet relays and protocols, e.g., routers, gateways, etc. Introduction to network security. Application layer protocols, e.g., DNS, E-mail, etc. (Same as CSE 353)

NEW: CSE 353, Introduction to Computer Networks, 3 cr, 3 cl hrs
Prerequisites: CSE 222
Usually offered in the fall semester.
Introduction to computer networking, the ISOOSI protocol stack, LAN, MAN, and WAN. Physical layer: transmission media (wireline and wireless); data signaling, modulation, and coding; multiplexing. Fiber optics networking technology: protocols & examples. Data link Layer: error/flow control-- protocols design issues; MAC protocols for channel access and allocation. Wireless technology and protocols standards-- IEEE 802.11 physical layer and MAC sublayer protocols. Network layer: subnet switching (CS/DG/VC) & routing protocols (Non/Adaptive); Congestion Control and QoS protocols. ISO vs. (TCP-UDP)/IP the Internet protocol stacks. Internet relays and protocols, e.g., routers, gateways, etc. Introduction to network security. Application layer protocols, e.g., DNS, E-mail, etc. (Same as IT 353)

NEW: CSE 453, Advances in Computer Networks and the Internet, 3 cr, 3 cl hrs
Prerequisite: CSE 353
In depth coverage of layering protocols' stacks (ISOOSI and TCP/IP) and computer networks architectures, modern examples of LANs, MANs, WANs protocols/architectures, Recent developments in Fiber optics technology-- protocols and architecures. high speed "all-fiber-optics" networks. Internetworking: global addresses/names and translation, virtual networks and tunnels, routing, subnetworks switching protocols, IPv6, multicasting. Mobile IP. End-to-end protocols, TCP and UDP. Advances in Congestion control and resource allocation. Client-server models & applications. The QoS mechanism integrated/differentiated), ATM QoS. Network security: information and link security, encryption, internetworking security, IPsec, firewalls, VPN, wireless security. Analysis of networks protocols. (Same as IT 453)

NEW: IT 453, Advances in Computer Networks and the Internet, 3 cr, 3 cl hrs
Prerequisite: CSE 353
In depth coverage of layering protocols' stacks (ISOOSI and TCP/IP) and computer networks architectures, modern examples of LANs, MANs, WANs protocols/architectures Recent developments in Fiber optics technology-- protocols and architecures. high speed "all-fiber-optics" networks. Internetworking: global addresses/names and translation, virtual networks and tunnels, routing, subnetworks switching protocols, IPv6, multicasting. Mobile IP. End-to-end protocols, TCP and UDP. Advances in Congestion control and resource allocation. Client-server models & applications. . The QoS mechanism integrated/differentiated), ATM QoS. Network security: information and link security, encryption, internetworking security, IPsec, firewalls, VPN, wireless security. Analysis of networks protocols. (Same as CSE 453)

Add the following cross-listed courses:

IT 466, Project Management, 3 cr, 3 cl hrs
Prerequisite: MATH 283, MGT 472 or consent of instructor
Development of work breakdown structures and multi-factor project simulations to be used in dynamic resource allocations. Assessment and evaluation of project models over time. (Same as MGT 476)

IT 330, Management and Organizational Behavior, 3 cr, 3 cl hrs
Prerequisites: ENGL 112 and upper-class standing or consent of instructor
Classical and contemporary organization theories, interpersonal and organization behavior, motivation, communication, leadership, decision process in organizations. (Same as MGT 330)