Rev. 04/2008

REQUIREMENTS FOR EMPHASIS AREAS

Notes:

1. All emphasis areas require a minimum of 9 credits. Not all courses listed below have 3 credits. Therefore, depending on the set of courses that you select, you may need to complete more than 3 courses to satisfy the 9 credit hour minimum.
2. Not all courses are taught every semester, and some times may conflict with required courses. It is your responsibility to plan ahead given these constraints.

a) Applied Engineering, Mathematics, and Science

Students will complete 9 credits by taking 1-3 engineering course(s), 0-2 mathematics course(s), and 0-1 science course from the following lists:

Options for Engineering Course(s):

- CH E 401 (Transport Phenomena)
- CME 402 (Solid State Materials)
- CME 424 (Optical Materials)
- EM 201 (Statics)
- IE 462 (Six Sigma Quality)
- ME 302 (Mechanics of Materials)
- ME 430 (Mechanics of Composite Materials)
- ME 432 (Advanced Strength of Materials)

Options for Mathematics Course(s):

- MTHSC 302 (Statistics for Science and Engineering) or EX STAT 411 (Statistical Methods for Process Development and Control)
- MTHSC 434 (Advanced Engineering Mathematics)
- MTHSC 450 (Introduction to Mathematical Models)

Options for Science Course:

- CH 313/315 (Quantitative Analysis)
- CH 402 (Inorganic Chemistry)
- CH 411 (Instrumental Analysis)
- CH 413 (Chemistry of Aqueous Systems)
- CH 421 (Advanced Organic Chemistry)
- CH 427 (Organic Spectroscopy)
- CH 435 (Atomic and Molecular Structure)
- PHYS 222 (Physics with Calculus III)
- PHYS 420 (Atmospheric Physics)
- PHYS 432 (Optics)
- PHYS 441 (Electromagnetics I)
- PHYS 452 (Nuclear and Particle Physics)
- PHYS 465 (Thermodynamics and Statistical Mechanics)

b) Biomolecular Science and Engineering

Students will complete 9 credits by taking 1-2 science course(s) and 1-2 engineering courses from the following lists:

Options for Science Courses:

BIOCH 302 (Molecular Biology Laboratory)
BIOCH 431 (Physical Approach to Biochemistry)
BIOCH 433 (General Biochemistry Lab)
BIOCH 406 (Physiological Chemistry)
BIOCH 436 (Nucleic Acid and Protein Biosynthesis)
CH 404 (Bioinorganic Chemistry)
CH 414 (Bioanalytical Chemistry)
CH 425 (Medicinal Chemistry)
GEN 416 (Recombinant DNA)
GEN 418 (Biotechnology I: Nucleic Acid Techniques)
MICRO 305 (General Microbiology)
MICRO 407 (Food and Dairy Microbiology)
MICRO 417 (Molecular Mechanisms of Carcinogenesis and Aging)

Options for Engineering Courses:

BIOE 302 (Biomaterials)
BIOE 401 (Biomedical Design)
BIOE 402 (Biocompatibility)
BIOE 448 (Tissue Engineering)
BMOLE 403 (Biotransport)
BMOLE 423 (Bioseparations)
BMOLE 425 (Biomolecular Engineering)
BMOLE 426 (Biosensors and Bioelectronics)
BMOLE 427 (Membranes for Biotechnol. Biomed.)
CH E 428 (Biochemical Engineering)
PHYS 417 (Introduction to Biophysics)

c) Polymeric Materials

Students will complete the required 9 hours by selecting courses from the following options:

Options for Courses:

BIOE 302 (Biomaterials)
CH 451 (Frontiers in Polymer Chemistry)
CH E 401 (Transport Phenomena)
CH E 445 (Special Topics, Polymer related)
PFC 415 (Intro to Polymer Science and Engineering) *or* CH E 412 (Polymer Engineering)
PFC 417 (Polymer and Fiber Laboratory)
PKGSC 416 (Application of Polymers in Packaging) [Needs consent of instructor for registration]

d) Environmental Engineering

Students will complete 9 hours by taking 1 science/policy and 2 engineering courses from the following lists:

Options for Science/Policy Courses:

CH 413 (Chemistry of Aqueous Systems)
CH 411 (Instrumental Analysis)
PHYS 420 (Atmospheric Physics)

Options for Engineering Courses:

BE 440 (Renewable Energy Resource Engineering)
CH E 401 (Transport Phenomena)
EE&S 401 (Environmental Engineering)
EE&S 402 (Water and Waste Treatment)
EE&S 410 (Environmental Radiation Protection)
EE&S 411 (Ionizing Radiation Detection and Measurement)
EE&S 430 (Air Pollution Engineering)
EE&S 480 (Environmental Risk Assessment)
EE&S 485 (Hazardous Waste Management)
EE&S 486 (Pollution Prevention and Industrial Ecology)

e) Business Management

9 credit hours are required. Students must take MGT 201 (Principles of Management) plus two other courses from the following list:

Options for Courses:

ELE 301 (Executive Leadership and Entrepreneurship I)
ELE 400 (Technology Entrepreneurship)
ELE 401 (Executive Leadership and Entrepreneurship II)
ECON 306 (Managerial Economics)
ECON 310 (International Economy) **cannot be used to double-count for emphasis area credit and Social Science credit*
ECON 321 (Economics of Innovation)
MKT 314 (New Venture Creation I)
MGT 315 (New Venture Creation II)
MGT 390 (Operations Management)
MGT 411 (Project Management)
MKT 426 (Business-to-Business Marketing)

f) Energy Studies

Students will complete the required 9 hours by selecting courses from the following options:

Options for Courses:

APEC 457 (Natural Resource Economic Theory and Policy)
BE 440 (Renewable Energy Resource Engineering)
CME 433 (Combustion Systems and Environmental Emissions)
ME 420 (Energy Sources and Their Utilization)

g) Selected Minor

Students may use the 9 hours devoted to the Emphasis Area requirement to select and complete any minor, with the exception of the Chemistry minor or the Cluster minor.