

TECHNICAL EMPHASIS (TE) AREAS

Guiding principles for technical emphasis courses:

- **Students must have their technical emphasis courses approved in advance (whether choosing from the list above or proposing a unique option). [Complete this form](#) to have your technical emphasis courses approved.**
- The list of emphasis areas is suggestive but not exclusive. The list is meant to guide advisors and students in selecting a technical emphasis.
- Students may propose an emphasis for approval by the undergraduate coordinator. The proposed courses should be justifiably (a) related to one another and (b) in support of the MSE major. As an example, for a student studying the computational modeling of polymers, the student might propose MSE 464, MSE 397, and MATH 365.
- All 9 cr must be related to one another and 6 cr should be upper division (some exceptions may be allowed).
- Up to 3 credits of MSE 493 (internship), MSE 496 (independent study), or VIP (300- or 400-level) may be counted toward the technical emphasis (with the requirement that they be part of a coherent set still in place).
- **Note: Not every course listed is offered every year or every semester. Consult the course catalog/schedule!**

GET A MINOR AND MORE

The TE areas listed below require fewer than 9 credits for a minor (on top of courses already required for your MSE degree). You'll need to complete 9 credits in that area though if you choose it for your TE.

Emphasis area	Choose from these courses (others may count too)
Applied mathematics (minor)	MATH 365, MATH 301, MATH 433, MATH 436, MATH 465
Physics (minor)	PHYS 412, PHYS 415, PHYS 432, other upper division PHYS

DIVE DEEPER INTO MATERIALS

The TE areas in this category aren't working toward a specific minor, but have been chosen in thematic areas which would support your MSE degree. Pick one of these if you want to dig deeper in a particular area of focus.

Emphasis area	Choose from these courses (others may count too)
Art materials	ART 221, ART 225, ART 226, ART 303, ART 304, ART 339
Computational materials	MSE 464, MSE 463, PHYS 325, MATH 365, GEOS 357
Electronic materials and devices	PHYS 415, PHYS 412, ECE 320, ECE 420, ECE 440
Materials science	Any upper division MSE course
Secondary education	STEM-ED 310, STEM-ED 350, STEM-ED 410, STEM-ED 480
Soft materials	CHEM 301/302, PHYS 307, PHYS 436, polymers course
Thermal properties	PHYS 432, ME 321, ME 323
Biomaterials	MSE 477, ME 356, BIOL 191

COURSES TOWARD A MINOR

The TE areas in this category can result in a minor, but you'll need to complete additional credits to earn the minor (the number of additional credits needed are on top of those that might count toward your MSE degree and the courses listed in the second column).

Emphasis area	Required courses that can fulfill technical emphasis	Additional credits	Total credits
Biomedical engineering	MSE 477, ME 356, BIOL 191	9	24-27
Chemistry	CHEM 211, CHEM 212, CHEM 307, CHEM 308	5	23
Computational science and engineering	CS 121, CS 221, MATH 365	10	27
Electrical engineering	ECE 212/L, ECE 230/L, ECE 320	6	20
Entrepreneurship management	ENTREP 320, ENTREP 420, ENTREP 421	9	18
Industrial engineering	SCM 345, SCM 380, ENGR 360, SCM elective	6	24
Sustainability	CE 320*, ECON 333*, PHIL 327* (or other elective option)	12	21
Workplace communication	COMM 231, COMM 361, COMM 485	12	21

COURSES TOWARD A CERTIFICATE

The TE areas in this category can result in a certificate, but you'll need to complete additional credits to earn the certificate (the number of additional credits needed are on top of those that might count toward your MSE degree and the courses listed in the second column).

Emphasis area	Required courses that can fulfill technical emphasis	Additional credits	Total credits
Business bridge to career	BUSBTC 301, BUSBTC 203, BUSBTC 320	3	12
Design ethnography	ETHNO 460 through 468	3	12
ID:EA certificate	COID 297 (3 different offerings)	3	12
Leadership and human relations	LEAD 325, LED 326, LEAD 327	7	16
Business analytics	ITM 301, ITM 315, ITM 330	3	15

NOTE: In each of these cases, the full certificate must be completed for the courses to count for the technical emphasis.