

Technical elective requirements – 18 total credit hours

MNE Credits	9 credit hours - technical elective courses from the MNE department with at least one of those three courses at the 600 level or above. Students are allowed to transfer one MNE technical elective, but the >600 level course requirement must be taken at K-State.
COE Credits	3 credit hours – one technical elective course from the 200-level or above College of Engineering (including MNE) classes.
"Other" Credits	6 credit hours – two technical elective credits from 200-level or above College of Engineering (including MNE), Math, Chemistry, Physics, Biology, Business Administration classes, or 400-level or above Statistics classes. Other classes that strengthen a student's program of study will be considered and require advisor and department head approval.

Technical electives by SUBJECT AREA

Automatic Controls

CHM 230 Chemistry II. (4) I, II, S. Pr.: CHM 210 or 220.
CIS 209 C Programming for Engineers. (3) I, II, S. Pr.: MATH 220.
ECE 241 Introduction to Computer Engineering. (3) I, II.
ECE 431 Microcontrollers. (3) I, II. Pr.: ECE 241 and CIS 200 or 209.
ECE 441 Design of Digital Systems. (3) I, II. Pr.: ECE 210 and ECE 241.
ECE 631 Microcomputer Sys Design. (3) II. Pr.: CIS 308 or 209 or ME 400; ECE 431, 525 or 519.
MATH 630 Introduction to Complex Analysis. (3) I. Pr.: MATH 240.
ME 635 Dynamics of Flight-Stability and Control. (3) Pr. or conc.: ME 570.
ME 640 Control of Mechanical Systems II. (3) I. Pr.: ME 570, MATH 551.
ME 656 Machine Vibrations I. (3) II. Pr.: ME 512 and MATH 240.
ME 716 Intermediate Dynamics. (3) II. Pr.: ME 512 and MATH 240.
ME 730 Control Systems Analysis and Design. (3) II. Pr.: ECE 530 or ME 640.
ME 760 Engg Analysis I. (3) I, in even years. Pr.: MATH 240 + senior standing.
STAT 490 Statistics for Engineers. (1) I, II.
STAT 491 Statistics for Engineers II. (1) I, II. Pr.: STAT 490.
STAT 510 Introductory Probability and Statistics I. (3) I, II. Pr.: MATH 221.
STAT 511 Introductory Probability and Statistics II. (3) II. Pr.: STAT 510.

Business / Management / Law

ACCTG 231 Acct. for Business Ops. (3) I, II, S. Pr.: MATH 100 and GENBA 110 or soph. standing DEN 550 Engineering Law. (3) I. Pr.: Junior standing.
ENTRP 440 Entrepreneurship. (3) I, II. Pr.: FINAN 450, MANGT 420, MKTG 400.
FINAN 450 Principles of Finance. (3) I, II, S. Pr.: ECON 120, STAT 350, ACCTG 231.
IMSE 501 Industrial Management. (3) I, II.
IMSE 541 Statistical Quality Control. (3) I. Pr.: STAT 511.
IMSE 605 Advanced Industrial Management. (3) I. Pr.: IMSE 501 or MANGT 420.
MANGT 390 Business Law I. (3) I, II. Pr.: Junior standing.
MANGT 420 Management Concepts. (3) I, II, S.
MANGT 421 Introduction to Operations Management. (3) I, II, S. Pr.: STAT 350.
MANGT 520 Organizational Behavior. (3) I, II. Pr.: MANGT 420.
MANGT 522 Operations Planning and Cnl. (3) II, Pr.: MANGT 421.
MANGT 530 Industrial and Labor Relations. (3) I. Pr.: Junior standing.
MANGT 653 Business Project Management. (3) I. Pr.: MANGT 420 and 421.
MKTG 400 Marketing. (3) I, II, S. Pr.: ECON 110 or 120.
MKTG 547 Intel Business. (3) On sufficient demand. Pr.: MKTG 400, MANGT 420.
MKTG 550 Business Marketing. (3) On sufficient demand. Pr.: MKTG 400.

Nuclear

BIOCH 521 General Biochemistry. (3) I, II, S. Pr.: CHM 350.
BIOL 198 Principles of Biology. (4) I, II, S. (Advisor approval required) BIOL 450 Modern Genetics. (4) I, II. Pr.: BIOL 198, CHM 230, MATH 100.
CHM 230 Chemistry II. (4) I, II, S. Pr.: CHM 210.
CHM 350 General Organic Chemistry. (3) I, II, S. Conc. enrollment in CHM 351 is urged. Pr.: CHM 230 or 250.
CIS 209 C Programming for Engineers. (3) I, II, S. Pr.: MATH 220.
ECE 525 Electronics I. (3) I, II. Pr.: STAT 510, ECE 410 or 519.
ECE 581 Energy Conversion. (3) I, II. Pr.: ECE 410 or ECE 519.
ME 760 Engineering Analysis I. (3) I Pr.: MATH 240 and senior standing.
NE 250 Reactor Operations Laboratory. (3) I, II, S. Pr.: PHYS 213.
NE 612 Principles of Radiation Detection. (3) II. Pr.: NE 495.
NE 630 Nuclear Reactor Theory. (3) I. Pr.: MATH 240, NE 495.
NE 648 Nuclear Reactor Laboratory. (3) II Pr.: NE 612, 630.
NE 690 Radiation Protection and Shielding. (3) I. Pr.: NE 495.

NE 761 Radiation Measurement Systems. (3) II. Pr.: NE 612.
STAT 490 Statistics for Engineers. (1) I, II.
STAT 491 Statistics for Engineers II. (1) I, II. Pr.: STAT 490.
STAT 510 Introductory Probability and Statistics I. (3) I, II. Pr.: MATH 221. STAT 511 Introductory Probability and Statistics II. (3) II. Pr.: STAT 510.

Solid Mechanics / Machine Design

BAE 345 Properties of Biological Materials. (2) II. Pr.: PHYS 213.
BAE 350 Off Road Machinery Systems. (2) I. Pr.: CHM 210.
BAE 750 Analysis and Design of Off-Highway Vehicles. (3) II. Pr.: BAE 536 or ME 574.
CE 534 Mechanics of Materials Laboratory. (1) I, II. Pr. or conc.: CE 533.
CHE 356 Fundamentals of Electrical Properties. (1) I, II. Pr.: CHE 354.
CHE 648 Processing of Composite Materials. (3) I, II. Pr.: CHE 350 or 352.
CHE 650 Hazardous Waste Engineering Seminar. (1) I, II, S. Pr.: CHM 230.
CHE 653 Ceramic Materials. (3) I, II. Pr.: CHE 350 or 352.
CHE 661 Processing of Materials for Solid State Devices. (3) I, II. Pr.: CHE 350 or 352.
CHE 681 Engineering Materials II. (3) I, II, S. Pr.: CHE 350 or 352.
CIS 209 C Programming for Engineers. (3) I, II, S. Pr.: MATH 220.
IMSE 251 Manufacturing Processes Lab (1) I, II. Pr. or conc.: IMSE 250.
IMSE 252 Welding Laboratory. (1) I, II.
IMSE 253 Net Shape Manufacturing Lab. (1) I. Pr. or conc.: IMSE 250, ME 212.
IMSE 254 Machining Lab (1) I. Pr. or conc.: IMSE 250, ME 212.
IMSE 255 Computer Numerical Control Lab (1) I, II. Pr.: IMSE 253 or 254.
IMSE 563 Manufacturing Processes Engg. (4) II, in odd years. Pr.: IMSE 251, CHE 352, CE 530.
IMSE 564 Product and Process Engg. (3) I. Pr.: IMSE 250, 251, 530.
IMSE 610 Occupational Safety Engg. (3) II, in even years. Pr.: IMSE 251.
IMSE 623 Industrial Ergonomics. (3) I. Pr. or conc.: STAT 510.
IMSE 662 Computer Aided Manufacturing (3) I. Pr.: IMSE 251 CIS 209 or 200 or ME 400.
ME 563 Machine Design II. (3) I, II. Pr.: ME 533.
ME 610 Finite Element Appl. in ME. (3) I. Pr.: CE 533.
ME 651 Intro to Composites. (3) I. Pr.: CE 533 and senior standing in engg.
ME 656 Machine Vibrations I. (3) II. Pr.: ME 512 and MATH 240.
ME 716 Intermediate Dynamics. (3) II. Pr.: ME 512 and MATH 240.
ME 738 Experimental Stress Analysis. (3) I, in even years. Pr. or conc.: CE 533.
ME 760 Engineering Analysis I. (3) I. Pr.: MATH 240 and senior standing.
STAT 490 Statistics for Engineers. (1) I, II.
STAT 491 Statistics for Engineers II. (1) I, II. Pr.: STAT 490.
STAT 510 Introductory Probability and Statistics I. (3) I, II. Pr.: MATH 221. STAT 511 Introductory Probability and Statistics II. (3) II. Pr.: STAT 510.

Thermal Science / Fluid Mechanics

BAE 651 Air Pollution Engineering. (3) II. Pr.: ME 513, 571.
CHM 230 Chemistry II. (4) I, II, S. Pr.: CHM 210 or 220. STAT 490 Stats for Engineers. (1) I, II.
CIS 209 C Programming for Engineers. (3) I, II, S. Pr.: MATH 220.
IMSE 610 Occupational Safety Engg. (3) II, in even years. Pr.: IMSE 251.
ME 523 Thermodynamics II. (3) I, II. Pr.: ME 513.
ME 610 Finite Element Appl in ME. (3) I. Pr.: CE 533.
ME 620 Internal Combustion Engines. (3) I. Pr.: ME 523.
ME 622 Indoor Environmental Engineering. (3) II. Pr.: ME 571.
ME 628 Aerodynamics. (3) I. Pr.: ME 571 and MATH 240.
ME 631 Aircraft and Missile Propulsion. (3) II. Pr.: ME 523, 571, and MATH 240.
ME 633 Thermodynamics of Modern Power Cycles. (3) I. Pr.: ME 523.
ME 720 Intermediate Fluid Mechanics. (3) I. Pr.: ME 571, MATH 240.
ME 721 Thermal Systems Design. (3) I. Pr.: ME 573.
ME 722 Human Thermal Engineering. (3) I, in odd years. Pr.: ME 573.
ME 760 Engineering Analysis I. (3) I Pr.: MATH 240 and senior standing.
ME 773 Intermediate Heat Transfer. (3) II. Pr.: ME 573.
STAT 490 Statistics for Engineers. (1)

STAT 491 Statistics for Engineers II. (1) I, II. Pr.: STAT 490.
STAT 510 Introductory Probability and Statistics I. (3) I, II. Pr.: MATH 221.
STAT 511 Introductory Probability and Statistics II. (3) II. Pr.: STAT 510.

Technical electives by INDUSTRY

Aerospace

ME 563 Machine Design II. (3) I, II. Pr.: ME 533.
ME 610 Finite Element Appl in ME. (3) I. Pr.: CE 533
ME 628 Aerodynamics. (3) I. Pr.: ME 571 and MATH 240.
ME 631 Aircraft and Missile Propulsion. (3) II. Pr.: ME 523, 571, and MATH 240.
ME 635 Dynamics of Flight-Stability and Control. (3) II. Pr. or conc.: ME 640.
ME 640 Control of Mechanical Systems II. (3) I. Pr.: ME 570 and MATH 551.
ME 651 Intro to Composites. (3) I. Pr.: CE 533 and senior standing in engg.
ME 720 Intermediate Fluid Mechanics. (3) I. Pr.: ME 571, MATH 240.

Agricultural / Construction Machinery

BAE 350 Off Road Machinery Systems. (2) I. Pr.: CHM 210.
BAE 345 Properties of Biological Materials. (2) II. Pr.: PHYS 213.
BAE 750 Analysis and Design of Off-Highway Vehicles. (3) II, on sufficient demand.
Pr.: BAE 536 or ME 574.
ME 563 Machine Design II. (3) I, II. Pr.: ME 533.
ME 610 Finite Element Appl in ME. (3) I. Pr.: CE 533.
ME 656 Machine Vibrations I. (3) II. Pr.: ME 512 and MATH 240.

Automotive

IMSE 251 Manufact. Processes Lab. (1), I, II. Pr. or conc.: IMSE 250, ME 212.
ME 563 Machine Design II. (3) I, II. Pr.: ME 533.
ME 610 Finite Element Appl in ME. (3) I. Pr.: CE 533.
ME 620 Internal Combustion Engines. (3) I, Pr.: ME 523.
ME 651 Intro to Composites. (3) I. Pr.: CE 533 and senior standing in engg.
ME 656 Machine Vibrations I. (3) II. Pr.: ME 512 and MATH 240.

Consulting

ME/NE xxx Upper level Technical Electives in your Subject Area

Consumer Products

ENTRP 440 Entrepreneurship. (3) Pr.: FINAN 450, MANGT 420, MKTG 400.
IMSE 541 Statistical Quality Control. (3) I. Pr.: STAT 511.
IMSE 610 Occupational Safety Engg. (3) II, in even years. Pr.: IMSE 251.
IMSE 623 Industrial Ergonomics. (3) I. Pr.: STAT 510 ME
563 Machine Design II. (3) I, II. Pr.: ME 533.
MKTG 400 Marketing. (3) I, II, S. Pr.: ECON 110 and 120.

Heating, Ventilating, Air Conditioning, Refrigeration

ME 523 Thermodynamics II. (3) I, II. Pr.: ME 513.
ME 610 Finite Element Appl in ME. (3) I. Pr.: CE 533.
ME 622 Indoor Environmental Engineering. (3) II. Pr.: ME 571.
ME 720 Intermediate Fluid Mechanics. (3) I. Pr.: ME 571, MATH 240.
ME 721 Thermal Systems Design. (3) I. Pr.: ME 573.
ME 722 Human Thermal Engineering. (3) I, in odd years. Pr.: ME 573.
ME 773 Intermediate Heat Transfer. (3) II. Pr.: ME 573.

Machine Tools

ECE 241 Introduction to Computer Engineering. (3) I, II.
ECE 431 Microcontrollers. (3) I, II. Pr.: ECE 241 and CIS 200 or 209.
ECE 441 Design of Digital Systems. (3) I, II. Pr.: ECE 210 and ECE 241.
IMSE 610 Occupational Safety Engineering. (3) II. Pr.: IMSE 251.
ME 610 Finite Element Appl in ME. (3) I. Pr.: CE 533.
ME 640 Control of Mechanical Systems II. (3) I. Pr.: ME 570 and MATH 551.
ME 730 Control Systems Analysis and Design. (3) II. Pr.: ECE 530 or ME 640.

Manufacturing

IMSE 541 Statistical Quality Control. (3) I. Pr.: CIS 209, Pr. or conc.: STAT 511.
IMSE 563 Manufacturing Processes Engg. (4) II. Pr.: IMSE 251, CHE 352, CE 530 IMSE
623 Industrial Ergonomics. (3) I, II. Pr. or conc.: STAT 510

MATH 740 Calculus of Variations. (3) On sufficient demand. Pr.: MATH 722 or equiv. MATH 745 Ordinary Differential Equations. (3) I. Pr.: MATH 240.
ME 760 Engineering Analysis I. (3) I Pr.: MATH 240 and senior standing. ME/NE xxx Upper level Technical Electives in your Subject Area.

Technical electives for GRADUATE SCHOOL

MATH 630 Introduction to Complex Analysis. (3) I. Pr.: MATH 240.
MATH 632 Elementary Partial Differential Equations. (3) II. Pr.: MATH 240.
MATH 713 Advanced Applied Matrix Theory. (3) Pr.: MATH 551 or MATH 630..
MANGT 420 Management Concepts. (3) I, II, S.
MANGT 421 Intro to Operations Management. (3) I, II, S. Pr.: STAT 350.
ME 563 Machine Design II. (3) I, II. Pr.: ME 533.
ME 610 Finite Element Appl in ME. (3) I. Pr.: CE 533.
ME 656 Machine Vibrations I. (3) II. Pr.: ME 512 and MATH 240.

Nuclear

NE 612 Principles of Radiation Detection. (3) II. Pr.: NE 495.
NE 690 Radiation Protection and Shielding. (3) I. Pr.: NE 495.
NE 630 Nuclear Reactor Theory. (3) I. Pr.: MATH 240, NE 495.
NE 648 Nuclear Reactor Laboratory. (3) II Pr.: NE 612, NE 630.
NE 761 Radiation Measurement Systems. (3) II, odd years. Pr.: NE 612.

Oil & Gas Engineering

ME 720 Intermediate Fluid Mechanics. (3) I. Pr.: ME 571, MATH 240 ME
773 Intermediate Heat Transfer. (3) II. Pr.: ME 573.

Power Generation

BAE 651 Air Pollution Engineering. (3) II. Pr.: ME 513, 571.
ME 523 Thermodynamics II. (3) I, II. Pr.: ME 513.
ME 563 Machine Design II. (3) I, II. Pr.: ME 533.
ME 620 Internal Combustion Engines. (3) I. Pr.: ME 523.
ME 631 Aircraft and Missile Propulsion. (3) II. Pr.: ME 523, 571, and MATH
240. ME 633 Thermodynamics of Modern Power Cycles. (3) I, ME 523 ME 720
Intermediate Fluid Mechanics. (3) I. Pr.: ME 571, MATH 240.
ME 721 Thermal Systems Design. (3) II. Pr.: ME 573.
ME 773 Intermediate Heat Transfer. (3) II. Pr.: ME 573.
NE 630 Nuclear Reactor Theory. (3) I. Pr.: MATH 240, NE 495.

Processing

ME 523 Thermodynamics II. (3) I, II. Pr.: ME 513.
ME 720 Intermediate Fluid Mechanics. (3) I. Pr.: ME 571, MATH 240.
ME 773 Intermediate Heat Transfer. (3) II. Pr.: ME 573.

Project Management & Construction

ACCTG 231 Acct for Business Operations. (3) I, II, S. Pr.: Soph standing and MATH 100.
DEN 550 Engineering Law. (3) II. Pr.: Junior standing.
FINAN 450 Principles of Finance. (3) I, II, S. Pr.: ECON 120, STAT 350, and ACCTG 231.
IMSE 501 Industrial Management. (3) I, II.
IMSE 541 Statistical Quality Control. (3) I. Pr.: STAT 511.
IMSE 605 Advanced Industrial Management. (3) I. Pr.: IMSE 501 or MANGT 420.
MANGT 420 Management Concepts. (3) I, II, S.
MANGT 421 Introduction to Operations Management. (3) I, II, S. Pr.: STAT 350.
MANGT 520 Organizational Behavior. (3) I, II. Pr.: MANGT 420.
MANGT 522 Operations Planning and Control. (3) Pr.: MANGT 421.
MANGT 530 Industrial and Labor Relations. (3) I. Pr.: Junior standing.
MANGT 653 Business Project Management. (3) I. Pr.: MANGT 420 and 421.
ME/NE xxx Upper level Technical Electives in your Subject Area MKTG 400
Marketing. (3) I, II, S. Pr.: ECON 110 or 120.

Research & Development

ME/NE xxx Upper level Technical Electives in your Subject Area
ME 760 Engineering Analysis I. (3) I Pr.: MATH 240 and senior standing.

Technical Sales

DEN 550 Engineering Law. (3) II. Pr.: Junior standing.
MKTG 400 Marketing. (3) I, II, S. Pr.: ECON 110 or 120.
MANGT 421 Introduction to Operations Management. (3) I, II, S. Pr.: STAT 350 MKTG
547 Intl Business. (3) On sufficient demand. Pr.: MKTG 400, MANGT 420. MKTG 550
Business Marketing. (3) On sufficient demand. Pr.: MKTG 400.