

Industrial Engineering Approved Electives List and Requirements (Approved 11/14/2023)

Data Analytics Elective: IMSE 441, STAT 511 or STAT 705

Computer Programming Elective: CIS 200, CIS 209, ME 400, or CC 210

Engineering Electives: The 6 hours must be selected from the following courses. Note that a student planning to take the FE exam is advised to take classes with an *. BAE 345, BAE 346; CE 333, 530* (at most one of 333 and 530) and 533; CHE 354*, 355*, 356*, 520 and 521; ECE 410, 511, 519* and 571; ME 512*, 513, 571; IMSE 562.

IMSE Electives: The IMSE electives must be selected from the IMSE department. Any IMSE course that is not required IMSE course can be taken as an IMSE elective course. Students are encouraged to consider choosing these electives to emphasize an interest area, including Advanced Manufacturing, Data Analytics, Quantitative Decision Making, Supply Chain Management and Engineering, and Safe Work Environment.

K-State Core: K-State general education requirements that account for 34 hours in seven areas. IMSE students should take the following courses (+ recommended not required): **KSC-1 English:** ENGL 100 and 200. **KSC-2 Communication:** COMM 106 (109, or 322), **KSC-3 Math & Stat:** MATH 220, **KSC-4 Natural & Physical Sciences:** PHYS 213, **KSC-5 Social & Behavioral Sciences:** 6 hrs, 2 courses from 2 subjects from the K-State KSC-5 list; students are recommended to take ECON 110+ or 120+ (preferred) + 3 hrs (other non ECON course such as PSYCH 110+, 115+, SOCIO 211+, or 214+); **KSC-6 Arts & Humanities:** 6 hrs, 2 courses from 2 subjects from the K-State KSC-6 list (students may choose freely);

KSC-7 Free Electives: 6 hrs (all 100 and 200 level courses are eligible; ‡ possible option); students may choose to complete their free electives with required IE courses (e.g. MATH 221, MATH 222, CHEM 230, or PHYS 214) to free up hours for more advanced study (see the focus areas below) and/or using these hours towards earning minors (e.g. ACCT 241+ towards a Business Minor); other popular minors include statistics, math, and a foreign language; students who are interested in leadership may take: any 100 and 200 LEAD courses‡; other courses for free elective include: MATH 100‡, 150‡, BIOL 198‡, BIOL 201‡, CHEM 230‡, and any introductory courses (ME 101‡, ECE 210‡, or CE101‡).

Substitutions: IMSE 591 and IMSE 592 can substitute for IMSE 580. Prerequisite or concurrent for both IMSE 591/592 and 580 are: IMSE 541, IMSE 555, IMSE 633, and IMSE 660 or (Prerequisite ME 533 for mechanical engineering students).

IMSE Assembly Requirement: Each semester, a student must enroll in IMSE 015 unless he/she is a concurrent B.S./M.S.I.E. student, in which case he/she must enroll in either IMSE 015 or IMSE 892.

IMSE Graduation Criterion: To graduate with a Bachelor's degree in Industrial Engineering, students must have a ≥ 2.200 GPA in all IMSE classes taken for undergraduate credit at Kansas State University. Course grades that have been removed by the K-State Retake policy will not apply to this GPA calculation.

IMSE Course Retake Criterion: Any IMSE course being taken for the third time in any five-year period may not be used to fulfill a student's B.S.I.E. graduation requirements.

Example Courses to emphasize an interest area:

Advanced Manufacturing:

IMSE 562 – Materials and the Impact of Manufacturing Processes

IMSE 563 – Manufacturing Processes Engineering

IMSE 564 – Product and Process Engineering

IMSE 641 – Quality Engineering

IMSE 662 – Computer Aided Manufacturing

IMSE 664 – Additive Manufacturing

Data Analytics:

After choosing your Required Data Analytics Elective course (IMSE 441 or STAT 511 or STAT 705), take one or more of the remaining Data Analytics courses as an elective course

IMSE 641 – Quality Engineering

IMSE 730 – Data Engineering I – Time Series and Topological Data Analysis

IMSE 785 – Big Data Analytics

Quantitative Decision Making:

IMSE 751 – Normative Theory of Decisions and Games

IMSE 752 – Multiple Criteria Decision Analysis

IMSE 760 – Stochastic Calculus Financial Engineering

IMSE 785 – Big Data Analytics

Supply Chain Management and Engineering:

IMSE 605 – Advanced Industrial Management

IMSE 710 – Transportation Logistics

IMSE 730 – Data Engineering I – Time Series & Topological Data Analysis

Safe Work Environments:

IMSE 610 – Occupational Safety Engineering

IMSE 625 – Work Environments