Industrial Engineering: Technical Electives Selection Guideline

1. Basic Requirement

- **Industrial Engineering requires 12 units of technical elective (about 4 course)**
- **All coursework must be upper division (300/400 level), with a minimum of 6 units 400-level coursework required**

2. Course Selection Guidance and Strategies

Before you read the following guideline, the most important thing to know your own interests and what kind of job or study after you graduated with your B.S.. Following these information, you will have three possible strategies:

Strategy 1: "I am interested in courses in Industrial Engineering, and I would like to select my technical electives <u>in a focus area in IE.</u>"

➡ **Select a focus area based on your interests and then select courses in that area in the following pre-approval course table.**

If the number of courses in a focus area is less than 4 courses, you will add 1-2 courses in other areas or directed research in the following table. For example, if you are interested in manufacturing area, you will take these 3 courses in the following table and add 1 more courses in other areas in the table.

If the number of courses in a focus area is more than 4 courses, you will just need to select 4 courses.

You are always welcome to contact your faculty advisor for suggestions in choosing courses.

Table 1. Pre-approved technical electives course list

Focus Area	Course #	Course Title	Prerequisite: AdvStand in Engineering +	Typically offered
I. Engineering Management	SIE 367	Engineering Management II	SIE 265	Spring
	SIE 414	Law for Engineers and Scientists		Spring
	SIE 415	Technical Sales and Marketing		Fall & Spring
	SIE 457	Project Management		Fall
	SIE 464	Cost Estimation	SIE 305	Spring
	Choose 4 of the 5 courses above			
II. Reliability and Quality Engineering	SIE 406	Quality Engineering	SIE 305	Spring
	SIE 408	Reliability Engineering	SIE 305	Fall
	SIE 430	Engineering Statistics	SIE 305	Fall
	Add 1 more course in other areas or SIE 492 directed research			
III. Operations Research	SIE 440	Survey of Optimization Methods	SIE 340	Spring
	SIE 474	Information Analytics & Decision-Making in Engr	SIE 305	Fall
	SIE 422	Engineering Decision Making Under Uncertainty	SIE 305	Fall
	Add 1 more course in other areas or SIE 492 directed research			
IV. Manufacturing	SIE 465	Supply Chain Management	SIE 305 & 340	Spring
	SIE 482	Lean Manufacturing and Operations	SIE 305	Spring
	SIE 483	Computer-Integrated Manufacturing	SIE 383	Spring
	Add 1 more course in other areas or SIE 492 directed research			
V. Human Factors Engineering	SIE 411	Human Machine Interaction	SIE 305	Fall
	SIE 430	Engineering Statistics	SIE 305	Fall
	Add 2 more courses (Please see Note 4), or add 1 more course and take 492 directed research			
VI. Healthcare Systems	SIE 477	Introduction to Biomedical Informatics	ECE 175 or equivalent	Fall
	SIE 411	Human Machine Interaction	SIE 305	Fall
	ESOC 414 **or** LIS 471*	Computational Social Science (**OR**) Introduction to Information Technology		Spring
	ISTA 420*	Applied Cyberinfrastructure Concepts		Fall
	Courses marked as * can be replaced with SIE 492 – Directed Research			
VII. Space and Sensor Systems	SIE 452	Space Systems Engineering		Spring
	SIE 454A	The Systems Engineering Process	SIE 305	Fall
	SIE 455	Sensor System Engineering	SIE 305	Spring
	SIE 456	Fundamental Guidance for Aerospace Systems		Fall
VIII. Other	SIE 458	Model Based Systems Engineering	SIE 454A (co-requisite)	Fall
	SIE 471	Systems Cyber Security Engineering		Fall
	SIE 472	Information Security and Research	SIE471, or ECE 478, or ECE 509, or MIS 416	Spring
	SIE 496	Special Topics in SIE	SIE 305	Fall, Spring, Summer

Faculty Guided Research	SIE 492	Directed Research (See Note 3)		Fall or Spring
Math Minor	MATH 300/400 level	If you are completing a math minor, you may apply 6 units of upper division MATH coursework		Fall Spring Summer

- Note 1: This is the pre-approved course list but it should not prevent you from choosing other courses at U of Arizona that meets your interests. If you would like to take a class that is not on this list, please contact the faculty advisor for approval.
- Note 2: Course descriptions of these courses in the list can be found in the course catalog: https://uaccess.schedule.arizona.edu/psp/uazsaprd2/UA_CATALOG/HRMS/h/?tab=DEFAULT
- Note 3: SIE 492, please contact the faculty who you hope to work with and you will submit the "Independent Study Proposal Form" to Danielle Embry before registration. Its registration needs approval.
- Note 4: Example courses: PSY 325 Cognitive Psychology, PSY 376 Human Factors: User Interface Design. You can choose at most 2 of them, or choose 1 of them and take the SIE 492 directed research

Strategy 2: "I am interested in courses in Industrial Engineering, and I would like to select my technical electives in different focus areas in IE. "

Pick up 4 courses in the table above with samples of several focus areas. For example, you can choose 2 courses in manufacturing, 1 course in operations research, and 1 course in engineering management.

Based on your interests, you can choose any 4 courses as your technical elective from the Table 1 above. The department has approved all of these courses in this list as your technical elective, and you do not need to get an approval from your faculty advisor.

You are always welcome to contact your faculty advisor for suggestions in choosing courses.

Strategy 3: "I am interested in courses outside of Industrial Engineering, and I would like to select these courses as my technical electives."

Please check the university course list, prepare your course list meeting the basic requirement on the first page of this document, and then meet your faculty advisor Dr. Changxu (Sean) Wu for approval.

Faculty Advisor

If you need help choosing your tech electives or need course approval for courses that are not listed on this list, you are very welcome to contact the faculty advisor for Industrial Engineering:
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