

# INDUSTRIAL ENGINEERING - 5-YEAR BACHELOR OF SCIENCE AND MASTER OF SCIENCE IN FINANCE

Industrial and systems engineering has a long-standing history and unique place among engineering majors as the academic discipline responsible for the economic viability of productive systems across industries. Industrial engineers are keenly aware of the goals and objectives of the enterprise. Additionally, industrial engineers receive a core curriculum in the rigorous underpinnings requisite for the quantification of uncertainty and the mitigation of financial risk to the enterprise. This 3+2 degree ensures that the successful graduate from the Mays Business School, department of finance, has a solid background in both the stochastic processes used to characterize and model the uncertainty coupled with the financial acumen requisite to ensure the economic viability of the enterprise. Students of the industrial and systems engineering program will take advantage of a series of internships and practicums that expose the undergraduate to various facets of financial stability and instability in industry. This program will produce a select and skilled group of industrial leaders that will take their place in the industrial world ensuring the viability of productive organizations around the globe.

## Program Requirements

The freshman year is identical for degrees in aerospace engineering, architectural engineering, civil engineering, computer engineering, computer science, electrical engineering, electronic systems engineering technology, environmental engineering, industrial distribution, industrial engineering, interdisciplinary engineering, manufacturing and mechanical engineering technology, mechanical engineering, multidisciplinary engineering technology, nuclear engineering, ocean engineering, and petroleum engineering (Note: not all programs listed are offered in Qatar). The freshman year is slightly different for chemical engineering, biomedical engineering and materials science and engineering degrees in that students take CHEM 119 or CHEM 107/CHEM 117 and CHEM 120.

Students pursuing degrees in biological and agricultural engineering should refer to the specific curriculum for this major. It is recognized that many students will change the sequence and number of courses taken in any semester. Deviations from the prescribed course sequence, however, should be made with care to ensure that prerequisites for all courses are met.

### First Year

Fall		Semester Credit Hours
CHEM 107	General Chemistry for Engineering Students <sup>1,4</sup>	3
CHEM 117	General Chemistry for Engineering Students Laboratory <sup>1,4</sup>	1
ENGL 103 or ENGL 104	Introduction to Rhetoric and Composition <sup>1</sup> or Composition and Rhetoric	3
ENGR 102	Engineering Lab I - Computation <sup>1</sup>	2
MATH 151	Engineering Mathematics I <sup>1,2</sup>	4

University Core Curriculum ( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a> ) <sup>3</sup>	3
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**Semester Credit Hours** 16

### Spring

ENGR 216/ PHYS 216	Experimental Physics and Engineering Lab II - Mechanics <sup>1</sup>	2
MATH 152	Engineering Mathematics II <sup>1</sup>	4
PHYS 206	Newtonian Mechanics for Engineering and Science <sup>1</sup>	3

University Core Curriculum ( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a> ) <sup>3</sup>	3
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Select one of the following: 3-4

CHEM 120 Fundamentals of Chemistry II<sup>1,4</sup>

University Core Curriculum (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/>)<sup>3,5</sup>

**Semester Credit Hours** 15-16

**Total Semester Credit Hours** 31-32

<sup>1</sup> A grade of C or better is required.

<sup>2</sup> Entering students will be given a math placement exam. Test results will be used in selecting the appropriate starting course which may be at a higher or lower level.

<sup>3</sup> Of the 21 hours shown as University Core Curriculum electives, 3 must be from creative arts (see AREN curriculum for more information), 3 from social and behavioral sciences (see IDIS curriculum for more information), 3 from language, philosophy and culture (see CVEN, EVEN and PETE curriculum for more information), 6 from American history and 6 from government/political science. The required 3 hours of international and cultural diversity and 3 hours of cultural discourse may be met by courses satisfying the creative arts, social and behavioral sciences, language, philosophy and culture, and American history requirements if they are also on the approved list of international and cultural diversity (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/>) courses and cultural discourse (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/>) courses.

<sup>4</sup> BMEN, CHEN and MSEN require 8 hours of fundamentals of chemistry which are satisfied with CHEM 119 or CHEM 107/CHEM 117 and CHEM 120; Students with an interest in BMEN, CHEN and MSEN can take CHEM 120 second semester freshman year. CHEM 120 will substitute for CHEM 107/CHEM 117.

<sup>5</sup> For BS-PETE, allocate 3 hours to core communications course (ENGL 210, COMM 203, COMM 205, or COMM 243) and/or 3 hours to UCC elective. For BS-MEEN, allocate 3 hours to core communications course (ENGL 203, ENGL 210, or COMM 205) and/or 3 hours to UCC elective.

### Second Year

Fall		Semester Credit Hours
ENGR 217/ PHYS 217	Experimental Physics and Engineering Lab III - Electricity and Magnetism <sup>1</sup>	2
MATH 251	Engineering Mathematics III <sup>1</sup>	3

MMET 181 or ISEN 281	Manufacturing and Assembly Processes I <sup>1</sup> or Essentials of Modern Manufacturing Methods for Engineering Design	3
PHYS 207	Electricity and Magnetism for Engineering and Science <sup>1</sup>	3
STAT 211	Principles of Statistics I <sup>1</sup>	3
Select one of the following: <sup>1</sup>		4
CSCE 110	Programming I	
CSCE 111	Introduction to Computer Science Concepts and Programming	
CSCE 206	Structured Programming in C	
<b>Semester Credit Hours</b>		<b>18</b>
<b>Spring</b>		
ACCT 640	Accounting Concepts and Procedures I <sup>6</sup>	3
ECON 202	Principles of Economics	3
ISEN 210	Fundamentals of Industrial Engineering Design <sup>1</sup>	4
ISEN 230	Informatics for Industrial Engineers <sup>1</sup>	3
MATH 304	Linear Algebra <sup>1</sup>	3
MEEN 221	Statics and Particle Dynamics	3
<b>Semester Credit Hours</b>		<b>19</b>
<b>Summer</b>		
FINC 601	Financial Analysis Practicum	3
FINC 602	Corporate Finance	3
<b>Semester Credit Hours</b>		<b>6</b>
<b>Third Year</b>		
<b>Fall</b>		
ACCT 327	Financial Reporting I <sup>7</sup>	3
FINC 601	Financial Analysis Practicum	1
ISEN 310	Uncertainty Modeling for Industrial Engineering <sup>1,7</sup>	3
ISEN 320	Operations Research I <sup>1</sup>	3
ISEN 330	Human Systems Interaction <sup>1</sup>	3
MATH 308	Differential Equations <sup>1</sup>	3
<b>Semester Credit Hours</b>		<b>16</b>
<b>Spring</b>		
ISEN 340	Operations Research II <sup>1</sup>	3
ISEN 350	Quality Engineering <sup>1</sup>	3
ISEN 355	System Simulation <sup>1</sup>	3
ISEN 370	Production Systems Engineering <sup>1</sup>	3
Select one of the following:		3
COMM 203	Public Speaking	
COMM 205	Communication for Technical Professions	
ENGL 203	Writing about Literature	
ENGL 210	Technical and Professional Writing	
<b>Semester Credit Hours</b>		<b>15</b>
<b>Fourth Year</b>		
<b>Fall</b>		
FINC 601	Financial Analysis Practicum	1
University Core Curriculum ( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a> ) <sup>3</sup>		3

Technical electives <sup>1,8</sup>		9
<b>Semester Credit Hours</b>		<b>13</b>
<b>Spring</b>		
ACCT 328	Financial Reporting II <sup>7</sup>	3
ISEN 460	Capstone Senior Design <sup>1</sup>	3
MEEN 222/ MSEN 222	Materials Science	3
University Core Curriculum ( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a> ) <sup>3</sup>		3
High Impact Experience <sup>9</sup>		0
ISEN 399	Professional Development	
<b>Semester Credit Hours</b>		<b>12</b>
<b>Fifth Year</b>		
<b>Fall</b>		
FINC 601	Financial Analysis Practicum	1
FINC 603	Investments	3
MGMT 680	Business and Corporate Strategy	3
Select one of the following:		3
BAEN 320	Engineering Thermodynamics	
ECEN 215	Principles of Electrical Engineering	
MEEN 315	Principles of Thermodynamics	
University Core Curriculum ( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a> )		3
<b>Semester Credit Hours</b>		<b>13</b>
<b>Spring</b>		
ACCT 647/ FINC 647	Financial Statement Analysis	3
FINC 605	Valuation and Financial Modeling	3
Graduate Technical Electives <sup>10</sup>		6
<b>Semester Credit Hours</b>		<b>12</b>
<b>Total Semester Credit Hours</b>		<b>124</b>

<sup>6</sup> MSF prerequisite course that counts towards ISEN degree.

<sup>7</sup> Course that will double count.

<sup>8</sup> A total of 9 hours of technical electives is required. The choice of courses to be taken must be made in consultation with the student's advisor and/or the Industrial Engineering Advising Office.

<sup>9</sup> All students are required to complete a high-impact experience in order to graduate. The list of possible high-impact experiences is available in the INEN advising office.

<sup>10</sup> The MS Finance degree requires students to take 6 hours of electives in support of their career goals.

The Bachelor of Science degree in Industrial Engineering requires a grade of C or better for required industrial engineering (ISEN) courses.

The program includes a total of 164 hours which up to 9 hours may be applied toward both the Bachelor of Science in Industrial Engineering and the Master of Science in Finance.

## Total Program Hours 164