B. S. in Industrial & Systems Engineering

Student Guide

San José State University

Department of Industrial and Systems Engineering
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General Information

Office Location
Engineering Building, corner of San Fernando & 7th Streets, San Jose, 4th floor - Room 485

Office Hours
8:00 a.m. to 12.00 p.m. and 1:00 p.m. to 5:00 p.m.

Telephone
(408) 924 - 3301

Fax
(408) 924 - 4040

Email Address
industrialsystems-dept@sjsu.edu

Web Site Address
http://ise.sjsu.edu/

Chair
Dr. Yasser Dessouky

Program Director and Major Advisor
Dr. Yasser Dessouky

Area Advisors
Dr. Yasser Dessouky

Production Systems and Simulation
Dr. Louis Freund
Dr. Dan Nathan-Roberts
Dr. Anil Kumar

Ergonomics and Human Factor Engineering
Dr. Minnie Patel
Dr. Jacob Tsao
Dr. Ayca Erdogan

Operations Research Applications and Applied Statistics
Mission Statement

To serve society, with emphasis on the manufacturing and service sectors by

- Providing undergraduate and graduate industrial and systems engineering education that prepares students to effectively apply engineering knowledge to the evaluation, design, and operation of complex industrial, service, and governmental systems comprised of people, equipment, and supplies through the application of modeling, measurement, and economic methods.

- Contributing to the enrichment of the profession and to the development of knowledge through faculty leadership, scholarship and professional practice.

- Meeting the needs of working professionals for continuing education in the fields of operations research, advanced statistical methods, ergonomics and human factors, production planning and control and related topics.

Educational Objectives

1. Function effectively as an ISE professional in any industry, government, or service organization designing, improving, and implementing efficient business processes.
2. Use methodologies and computational skills to identify, formulate, and develop solutions for problems normally encountered in their organizations.
3. Collect, analyze, and interpret data efficiently and effectively to solve systems analysis and engineering problems.
4. Evaluate the impact of their proposed solutions to engineering problems in the broader context of the organization or society.
5. Effectively communicate using written, oral and electronic media to articulate technical problems and their proposed solutions.
6. Recognize the need for life-long learning and growth within their chosen profession and to be familiar with the strategies they may employ to accomplish this.
Program Description

The BS - Industrial and Systems Engineering program prepares engineers for a broad scope of systems analysis and design challenges that deal with improving the overall performance of an organization or system. ISE’s focus is on productivity improvement, with concern for the human aspects of work as well as with finding the right combination of resources to ensure that the organization performs at its best. Using the latest computer-based analytical and modeling technologies, ISE bridges the gap between management and operations, applying organizational development, continuous improvement, Total Quality Management, ergonomics and production systems expertise. The goal of ISE is to assure that the organization’s systems are efficient, productive, safe and will not lead to cumulative injury, and that they incorporate the right tools and equipment. An industrial and systems engineer may be employed in almost any type of industry, business or institution, from retail establishments to manufacturing plants to government agencies to hospitals. The program prepares students to enter the profession immediately or to go on to graduate school. The undergraduate curriculum is accredited by the Accreditation Board of Engineering Technology (A.B.E.T.)
Rules and Policies

Major Advisor
A Major Advisor is a representative of the program who can assist you in selecting courses and develop a plan for fulfilling the SJSU and major requirements. You must consult your Major Advisor at least once each semester.

Writing Skill Test (WST) and Engr 100W
You must pass the WST and have upper division standing, in order to register for any Advanced General Education course (including Engr 100W). Engr 100W is a prerequisite for all Industrial and Systems Engineering senior courses. You are urged to take the WST as early as possible.

Placement Examinations
All undergraduate students must take the Entry Level Mathematics (ELM) Exam or be exempted from it before placement in the appropriate university mathematics coursework. All students who wish to enroll in the following courses are required to take the corresponding placement examinations.

- Engl 1A requires English Placement Test,
- Math 30 or Math 20 requires Calculus Placement Examination,

Drop Procedure
A student may petition to drop a course after the third week of instruction only for serious and compelling reasons. Poor performance in a class is not considered a serious and compelling reason for late-drop. Verification and meeting with the University office responsible for late drop are necessary.

Prerequisites and Corequisites
You can take an ISE course only if 1.) you have completed all prerequisites of the course before taking it, and 2.) you are taking all corequisites at the same time or have taken all corequisites before taking the course. A student taking a course without satisfying either of the above conditions will either be dropped by the instructor or get a failure grade.

Course Load
You should adjust your course load based on your scholastic records, working hours, and other factors. You should discuss your individual situation with your Major Advisor. Students will not be allowed to register for more than 18 units per semester without prior approval from the Department Chair with the Petition for Excess Units form.

Technical Electives
8 semester units of upper-division technical electives are required. You can select the technical electives from the approved list, however two technical electives must be selected from upper-level engineering courses. The choice of technical electives must be made in order to complete the Major Form. You need your Major Advisor’s approval (on the Major Form) to take any elective course that is not on the approved list. A “C” or better is required.

General Education
Questions on GE requirements should be directed to the Major Advisor who will refer the student to the student Resource Center, located in the Student Services Center underneath the 10th street garage, if further clarification is needed.
Major Form

An approved Major Form on file is required before taking any senior level ISE courses. A sample of the Major Form is included in this package. A major form must be submitted **one (1)** year prior to your anticipated date of graduation. In addition, the department office will contact you if there are any questions regarding your major form prior to approval. The following is the process to complete your Major Form. A major form can be downloaded as a word document from the department website: [http://ise.sjsu.edu/content/forms](http://ise.sjsu.edu/content/forms).

1. You must see your advisor and submit your Major Form and the complete documents for the approval and signature.

2. The department will then check your grades and submit your Major Form and the documents to the department’s Chair for the signature.

3. Upon department verification and approval, your Major Form and the documents will be taken to the Dean’s office for further verification. If the packet is complete, it will be forwarded to Admissions and Records.

Documents to Attach to Major Form:

1. Major form checklist/cover page
2. Graduation application
3. General education checklist (official or copy signed by GE assessment advisor or stamped by Advising Center)
4. College of engineering General Education checklist
5. Graduation courses not completed for the baccalaureate degree
6. SJSU transcripts (will be printed by ISE department staff)
7. Other college/university transcript(s) (copies are acceptable)
8. Articulation agreement(s) printed from [www.assist.org](http://www.assist.org) or equivalency form(s) for all course works that appear on your major form but were not completed at SJSU.

Reminder:

1. Any changes to a student’s approved major form must be documented by a “Changes of Course(s) on Major Form” form.
2. Don’t forget to submit copies of the transcript(s) to the department for course(s) with a “Blank grade” that will be taken at another college/university (Be sure that an OFFICIAL copy goes to the office of Admissions and Records)

Transfer Evaluation

Before enrolling in ISE 102 or ISE 130, you must see your Major Advisor to review credit for Mathematics, Physics, Chemistry, and Engineering coursework taken elsewhere.

Online course equivalents from other colleges can reached on the Internet via WWW with the URL, [http://artic.sjsu.edu/](http://artic.sjsu.edu/) or [www.assist.org](http://www.assist.org). Theses web sites offer information on which courses can be transferred from the 131 colleges and universities holding articulation agreements with San Jose State University.
The following steps are required for a transfer credit evaluation:

1. Obtain a set of unofficial transcripts showing all the Mathematics, Physics, Chemistry, and Engineering courses taken elsewhere that you consider equivalent to the corresponding SJSU courses. Note that the Admissions Office does not make transcripts available to the ISE Department.

2. If applicable, obtain copies of catalog descriptions of pertinent courses that were taken at schools other than California community colleges. Clark Library normally has copies of catalogs for most U.S. colleges.

3. If applicable, attach catalog descriptions, and submit to the appropriate SJSU departments the Equivalency Evaluation forms for those courses taken at schools other than California community colleges. The U.S. college forms can be obtained from the ISE Office, while the foreign college forms are processed through the Admissions and Records Office. Following review, these forms should be returned to the ISE Department.

4. Complete the worksheet included in the Transfer Evaluation Packet in ink. A list of course equivalencies between California community colleges and SJSU is included. Courses not found in this list require the completion of Equivalency Evaluation forms by the pertinent department to complete the evaluation.

5. If all your pertinent transfer coursework was done at California community colleges, attach the set of transcripts to the completed worksheet and submit to your Major Advisor. Within a week or so, unless there are problems, your official transfer evaluation should be complete and placed in your file with the ISE department.

6. If part (or all) of your pertinent transfer coursework was taken at schools other than California community colleges, attach the set of transcripts and copies of the signed Equivalency Evaluation forms to the completed worksheet and submit in person to your Major Advisor. Once processed, your official Transfer Evaluation will be signed by your Major Advisor and placed in your file with the ISE Department.
Requirements for B.S. Degree

(Total Minimum 120 Semester Units)

General Education........................................................................................................................................21 units

Preparation for the Major.........................................................................................................................26 units

MATH 30, 31, 32, 123 ................................................................................................................................13 units
PHYS 50/51 .................................................................................................................................................8 units
CHEM 1A.....................................................................................................................................................5 units

Engineering Common Core .......................................................................................................................11 units

CMPE 30, ENGR 10, ME 20, MATE 25

Required Courses in Engineering and Science.......................................................................................49 units

ISE 102, 105, 115, 120, 130, 131, 135, 140, 142, 151, 155, 167, 170, 195A, 195B;
CmpE 131, ENGR 100W

Approved Upper Division Electives........................................................................................................7 units

120 units
# Sample Four-Year Program

(Total minimum units required for degree is 120)

## FRESHMAN YEAR: 28 units

<table>
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<th>Spring</th>
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<td>Math 31</td>
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<td>Chem 1A</td>
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<td>Phys 50</td>
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<td>Engr 10*</td>
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<tr>
<td>Engl 1A</td>
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<td>Engl 1B</td>
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<td></td>
<td>14</td>
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* Transfer upper-division students may substitute an engineering science course for Engr 10.

## SOPHOMORE YEAR: 30 units

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<td>Phys 51</td>
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<td>ME 20</td>
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<td>American Studies 1A</td>
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<td>Math 123</td>
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<tr>
<td>CmpE 30</td>
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<td>American Studies 1B</td>
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Passing Writing Skills Test (WST) is required before taking Engr 100W

## JUNIOR YEAR: 30 units

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<td>ISE 120</td>
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<td>ISE 130</td>
<td>3</td>
<td>ISE 142</td>
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<td>Engr 100W</td>
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<td>ISE 105</td>
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<td>ISE 151</td>
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<td>Approved Technical Elective</td>
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All ISE senior courses require the completion of Engr 100W and Major Form on file

## SENIOR YEAR: 32 units

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<td>ISE 115</td>
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<td>ISE 135</td>
<td>3</td>
<td>ISE 155</td>
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<tr>
<td>ISE 140</td>
<td>3</td>
<td>ISE 195B</td>
<td>3</td>
<td></td>
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<tr>
<td>ISE 167</td>
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<td>GE Area S or V</td>
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<td>ISE 195A</td>
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<td>ISE 170</td>
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<td>GE Area S or V</td>
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ISE Course Descriptions

ISE 102. Engineering Economic Systems
Systems analysis applied to economic decisions in engineering; comparison of alternatives based on cost breakdown structure and time value of money; system life-cycle process; life-cycle economic concepts, costing methodology and applications. Corequisite: Math 31 & Engr 10 or equivalent. 3 units

ISE 103. Life Cycle Engineering
Life cycle analysis of products focused on the contexts of reducing energy and the carbon footprint. Methods to analyze and evaluate the environmental impacts of engineering activities. Interdisciplinary case studies and projects related to life cycle engineering. Prerequisite: ENGR 102, ME 172, ISE 105 or METR 135, or instructor consent. 3 units

ISE 105. Introduction to Systems Engineering and Activity Costing
Techniques for integrating engineering problem solving methods with systems theory including principles of problem identification, description, modeling, solution and implementation; applying traditional and activity based cost systems to assist engineers in decision making process through the product life cycle. Prerequisites: Math 31. 3 units

ISE 110. Manufacturing Processes
Fundamentals of manufacturing processes such as machining, forming, cutting, welding and casting. Selection of materials. Production facility practices and meteorology. Geometric dimensions and tolerancing. Prerequisite: ME 20 (C- or better). Misc/Lab: Lecture 2 hours/lab 3 hours. 3 units

ISE 112. Occupational Health Engineering
Legislative framework and historical perspective of work-related injuries and diseases: prevention assessments, legal and regulatory issues surrounding solutions to occupational health problems, principles of industrial hygiene and program management. Prerequisite: Junior standing in engineering. 3 units

ISE 114. Safety Engineering
Hazards, accident prevention and engineering approaches to the design of equipment, facilities and processes. Provides familiarity with system safety, system evaluation and evaluation of alternative countermeasures. Latest safety regulations and agencies responsible for their enforcement. Prerequisite: Junior standing. 3 units

ISE 115. Computer Integrated Manufacturing
Analyze, design and integrate manufacturing processes with CAD/CAM technologies including numerical control, material handling and storage, group technology and computer control. Prerequisite: ISE 120. Misc/Lab: Lecture 2 hours/lab 3 hours. 3 units

ISE 120. Work Methods Design and Measurement
Design of efficient and effective work processes; includes process management, methods analysis and improvement and work measurement. Prerequisite: Math 032. Lecture 2 hours/lab 3 hours. Lab fee required. 3 units.

ISE 130. Engineering Probability & Statistics
Probability theory, graphical displays of data, graphical methods of comparisons of samples and hypotheses testing. Statistical estimation and inference. Uses graphical statistical packages. Prerequisite: Math 32 or Math 71. 3 units

ISE 131. Statistical Process Control and Improvement
Statistical computations, sampling procedures, development and use of control charts and utilization of
computerized statistical packages. Design of statistical quality control systems. The seven tools of quality;
process capability studies.
Prerequisite: ISE 130 (with a grade "C-" or better) or equivalent. Misc/Lab: Lecture 2 hours/lab 3 hours. 3
units

ISE 135. Design of Experiments
Tests of composite hypotheses, analysis of variance, statistical decision theory, sampling procedures, design and
implementation of statistical process control systems, response surface experimental design, Taguchi
experimental design, system reliability, utilization of computerized statistical packages.
Prerequisite: ISE 130 (with grade of "C-" or better) or equivalent. 3 units

ISE 140. Operations Planning and Control
Design, implementation and evaluation of manufacturing, planning and control systems. Includes MRP II, ERP,
JIT.
Prerequisite: ISE 102, ISE 120, ISE 170. 3 units

ISE 142. Service Systems Engineering and Management
Operational productivity, operational quality strategy and information technology applications in the service
sector through the use of tools, techniques and case studies. Contrasts manufacturing and service sector issues
related to supply chain, process quality, information systems and other topics
Prerequisite: Upper division standing. 3 units

ISE 145. Lean Manufacturing
Exploration and practice of techniques for optimizing production environments and product development. Just-
in-Time, project scheduling, Material Requirements Planning, Toyota Production System, Enterprise
Management systems. Prerequisite: BUS 140 or BUS 145 or ISE 140

ISE 151. Managing Engineering
Broad overview of engineering management theory and practice including: management's roles, responsibilities,
skills, strategy and planning; management systems, human resource management, problem solving and decision-
making; engineering ethics. Prerequisite: 100W course. 3 units

ISE 155. Supply Chain Engineering
A comprehensive coverage of supply chain topics; real world applications including logistics, inventory
management, risk pooling, value of information, strategic alliance, procurement and outsourcing strategies,
information technology, coordinated product and supply chain design, customer value, decision support systems.
Prerequisite: ISE 140. 3 units

ISE 159. Materials Handling and Distribution
Materials handling equipment, transport and storage environments. Design of distribution systems for
efficiency. Distribution cycles. Hazardous materials and military packaging. Monitoring and lab simulation of
distribution hazards. Prerequisite: ISE 135. 3 units

ISE 160. Healthcare Delivery Systems
Overview and analysis of health care delivery systems in the US with emphasis on the assessment, analysis, and
improvement of operational quality, efficiency, and effectiveness. Impact on primary components of health care
systems: facilities, approaches to care and treatment modalities, and personnel. Quantitative and qualitative
techniques and applications to improve health care systems; performance measures used to evaluate access and
quality of care. Impact of healthcare policies, laws, economics, and current US health care culture on
organizational performance and patient outcomes. Prerequisite: Junior Standing
ISE 161. Medical Errors Reduction and Patients Safety Engineering
Standardization of national reporting of medical errors; patient safety and high risks processes performance analysis; Safety improvements utilizing human factors techniques; information technology applications to reduce medication errors and improve patient safety; structured teams and systems to reduce clinical errors. Prerequisite: Junior Standing. 3 units.

ISE 162. Engineering Statistics and Analysis
Topics will include error analysis, probability, statistics including hypothesis testing, confidence limits and control variables, design of experiments and statistical process control as they are utilized in the chemical, materials and process engineering industries. Prerequisite: C- or better in PHYS 51 & PHYS 52 or PHYS 71; Math 32, Math 133A, Chem 1A, Chem 1B. CoRequisite: ENGR 10. Misc/Lab: Lecture 2 hrs/Calculation period 3 hrs. 3units.

ISE 163. Healthcare Information Systems
Current and emerging use of clinical information, electronic medical records and clinical information systems. Healthcare enterprise architecture. Pre-built automation models of unified patients records. Automated decision support. Integrated interfaces, interoperable record exchange, and meta knowledge integration. Security of healthcare information. Prerequisite: Junior Standing. 3 units.

ISE 164. Computer and Human Interaction
Introduction to human/computer interaction, paradigms for interaction, human performance capabilities, computer input/output device analysis and design, pattern recognition 3D audio, 3D visualization, application to virtual reality and multimedia. Prerequisite: Junior Standing. 3 units.

Healthcare activity costing and life-cycle, methodologies of modeling financial decisions, dynamic pricing techniques, and integrated financial analysis that spans clinical, access, and revenue functions. Financial risks assessment using statistical and stochastic methods as applied to pricing of alternative providers settings. Prerequisite: Junior Standing. 3 units.

ISE 167. System Simulation
Introduction to simulation. Monte Carlo techniques. Design and use of discrete-event computer simulation modeling techniques; theoretical and practical treatment of input to models; model validation methods and output analysis. Synchronized sampling, model comparisons. Prerequisites: CmpE 30 or Cmpe 46, ISE 130 (with grade “C-” or better), ISE 170. Misc: Lecture 2 hrs/Lab 3hrs. 3 units.

ISE 170. Operations Research
Development and application of mathematical models to industrial problems. Linear programming, network analysis, Markov models, game theory, queuing theory and decision analysis. Prerequisite: ISE 130 (with grade of "C-" or better). Pre/Corequisite: Math 123. 3units

ISE 180. Individual Studies
Individual work on special topics by arrangement. Prerequisite: Upper division standing and instructor consent. Repeatable: Repeatable for credit. CR/NC 1-3units

ISE 195A. Senior Industrial Engineering Design I.
Individual or group design projects. Proposal preparation with plans and specifications. Oral and written reports. Professional seminars. Prerequisite: ISE 105, ISE 120, Engr 100W, major form on file, and open only to seniors in good standing in the major. Misc/Lab: Lab 3 hours. 1unit

ISE 195B. Senior Industrial Engineering Design II.
Design of a complete industrial system including quality function deployment, technology trends, financial analysis, functional specifications, process design, production capability, quality management, manufacturing resource planning, equipment requirements, human resource management, management information systems, facility design and project management. Prerequisite: ISE 140 and ISE 195A (with grade of "C" or better). Misc/Lab: Lab 9 hours. 3 units

**ISE 197. Cooperative Education Project**
Part or full-time on-site paid work experience based on a pre-approved project assignment in area of student's career objective. Oral presentations, written final report and evaluation by project supervisor. Approved technical elective.
Prerequisite: Instructor consent. 3 units

**ISE 199. Special Topics in Industrial & Systems Engineering**
Contents vary from semester to semester. Prerequisite: Instructor approval
# Engineering General Education Worksheet

## Catalog Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Where Taken</th>
<th>Grade</th>
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<tbody>
<tr>
<td><strong>A. Basic skills (9 units)</strong></td>
<td><strong>B. Science &amp; Math (9 units)</strong></td>
<td><strong>C. Humanities &amp; Arts (9 units)</strong></td>
<td><strong>D. Social Sciences (9 units)</strong></td>
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<tr>
<td>Oral Communication</td>
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<tr>
<td>Written Communication 1A</td>
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<tr>
<td>Critical Thinking</td>
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<tr>
<td>Physical Science</td>
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<td>Life Science</td>
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<td><strong>Pending Completion of Engineering Degree</strong></td>
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<tr>
<td>Laboratory Science</td>
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<td><strong>Pending Completion of Engineering Degree</strong></td>
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<tr>
<td>Mathematical Concepts</td>
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<td><strong>Pending Completion of Engineering Degree</strong></td>
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<td>Arts</td>
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<td>Human Behavior</td>
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<td>Comparative systems</td>
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<tr>
<td>Social Issues</td>
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<tr>
<td>E. Human Understanding &amp; Development (3 Units)</td>
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### Prerequisites to SJSU Studies

- Pass Writing Skills Test: yes [ ] N/C [ ]
- Upper Division Standing: yes [ ] no [ ]

## SJSU Studies

<table>
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<td>ENGR 100w</td>
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<td>Z</td>
<td>Written Communication 11B</td>
<td>ENGR 100w</td>
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<tr>
<td>S</td>
<td>Self, Society &amp; Equality in the U.S.</td>
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<tr>
<td>V</td>
<td>Culture, Civilization &amp; Global Understanding</td>
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## Graduation Requirements

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<td>F3</td>
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### Physical Education Activity (2 courses)

1. [ ]
2. [ ]

Completed by: ____________________________
Date: ____________________________

REGISTRATION HOLDS WILL BE REMOVED BY THE MAJOR ADVISOR ONLY!
FAQs ABOUT THIS GENERAL EDUCATION WORKSHEET

What do I do with this?
This document which General Education courses you have completed and which courses you must still complete. Bring it to all of your advising sessions and keep a copy safely in your SJSU records file.

Who completed this worksheet?
This worksheet was completed by Engineering Student Success Center staff.

Is this worksheet an official document?
This worksheet is not an official document. Final review of general education requirements at the time of graduation is completed by the Evaluations staff in the SJSU Student Services Center.

I think there is an error on my worksheet.
This worksheet was completed based on transcripts that have been submitted to SJSU. Any work completed or currently in progress at a community college or at another university may not appear on this worksheet if you have not yet submitted the transcript to SJSU.

If you have questions about anything on this worksheet, please visit the Engineering Student Success Center in E334.
San Jose State University  
College of Engineering  
Department Industrial & Systems Engineering  
Major Form for B. S. in Industrial & Systems Engineering

Name (Last, First M.):  
Student ID:  
Minimum number of semester units for the degree: 120  
Bulletin: ______  
Proposed Semester of Graduation:  

ENGINEERING COMMON CORE (minimum 11 units)

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REQUIRED COURSES (minimum 49 units)

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APPROVED TECHNICAL ELECTTIVES (minimum 7 units)


Courses Required in Preparation for the Major – Mathematics, Chemistry, Physics (minimum 29 units)

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(Student's Signature) __________________________  will have completed all the requirements for the Bachelor of Science in ISE after: (a) successful completion of the above work.  
(b) An audit of the student’s transcript of record to verify that all-appropriate data has been entered accurately.  
(c) A minimum 2.0 GPA in all required courses has been achieved.  
(d) A minimum 2.0 GPA in all required & technical electives combined has been achieved.  
(e) A minimum 2.0 GPA in all required courses & technical electives taken at SJSU has been achieved.

(Signed) __________________________  Major Advisor.  
(Signed) __________________________  Department Chair  
[Date] ___________________________  
[Date] ___________________________
### Major Advising Form for B. S. in Industrial & Systems Engineering

<table>
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**Advisor Initials:**

**Advising Date:**

**Flag-off Initials:**

**Flag-off Date:**
Transfer Evaluation Form for B.S. In Industrial & Systems Engineering

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Major Advisor Signature ___________________________ Date ______________

* Show S(semester) or Q(quarter) next to the number of units for each entry in this column.
APPROVED LIST OF TECHNICAL ELECTIVES
(Note at least two electives must be engineering course and all courses must be completed with a grade of “C” or better)

Software Systems Engineering
CmpE 120 Computer Organization and Architecture
CmpE 135 Object-Oriented Analysis and Design
CmpE 133 Software Engineering II
Engr 136 Information Engineering
CmpE 124, Digital Design I
CmpE 126 Algorithms and Data Structure Design
CmpE 130, File Processing
CmpE 138, Database Systems Design
CmpE 148, Computer Networks

Semiconductor/Manufacturing
MatE 153 Electronic Properties of Solids
MatE 141 Materials Characterization
MatE/EE 129 Basic IC Processing
MatE 130 Characterization and Analysis of Semiconductor Devices
MatE/EE 167 Microelectronics Manufacturing Methods
MatE/ChE 166 Advanced Thin Films Processes
ME 106 Fundamentals of Mechatronics Engineering
ME 109 Heat Transfer in Electronics
ME 136 Design For Manufacturability
ME 165 CAD in Mechanical Engineering

Human Factors/Ergonomics
ISE 112 Engineering Occupation and Health
ISE 114, Safety Engineering
CE 170 Principles of Environmental Engineering
ISE 164 Computer and Human Interaction
Psyc 170 Industrial Organization Psychology
Psyc 173 Human Factors

Transportation and Traffic Management
CE 121 Transportation Engineering
CE 122 Traffic Engineering
CE 134 Project Management for Construction

Business Management
Psyc 175 Management Psychology
Bus 130 Introduction to Marketing
Bus 133A International Marketing
Bus 133B International Marketing: Pacific Rim
Bus 168 Management Issues in High Technology Firms
Bus 170 Business Finance

ISE Related
ISE 103 Life Cycle Engineering
ISE 110 Manufacturing Processes
ISE 145 Lean Manufacturing
ISE 159 Materials Handling and Distribution
ISE 196R Reliability Engineering
ISE 197 Cooperative Education Project

Healthcare
ISE 160 Healthcare Delivery Systems
ISE 161 Medical Errors Reduction and Patients Safety Engineering
ISE 163 Healthcare Information Systems
ISE 166 Healthcare Financial Engineering Management