

# **B. S. in Industrial & Systems Engineering**

## **Student Guide**



**San José State University**

**Department of Industrial and Systems  
Engineering**

- 1. General Information**
- 2. Rules and Policies**
- 3. Requirements for B. S. degree**
- 4. Flow Diagram of Required Courses**
- 5. Sample Four-year Plan**
- 6. Course Descriptions**
- 7. General Education Check List**
- 8. Major Form**
- 9. Major Advising Form**
- 10. Transfer Evaluation Form**
- 11. Approved List of Technical Electives**

## **General Information**

### **Office Location**

Engineering Building, corner of San Fernando & 7th Streets,  
San Jose, 4<sup>th</sup> 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

Dr. Hongrui Liu

### **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.

## Program Educational Objectives

1	Function effectively as an ISE professional designing or improving and implementing business processes.
2	Identify and use methodologies to formulate and develop solutions for problems encountered in their organizations.
3.	Use computational skills to analyze and interpret data to solve systems problems.
4.	Evaluate impact of their solutions in the broader context of the organization or society.
5.	Effectively communicate using written, oral and visual media to articulate problems, findings and their proposed solutions.
6.	Engage in life-long learning and growth within their chosen profession.

## **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 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

6 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 ESSC, located in the Engr 334, 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>.

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 Admission s 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 be reached on the Internet via **WWW** with the URL, <http://artic.sjsu.edu/> or [www.assist.org](http://www.assist.org). These 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. SJSU 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)**

<i>General Education</i> .....	<i>27 units</i>
<i>Preparation for the Major</i> .....	<i>26 units</i>
MATH 30, 31, 32, 123 .....	<i>13 units</i>
PHYS 50/51 .....	<i>8 units</i>
CHEM 1A.....	<i>5 units</i>
 <i>Engineering Common Core</i> .....	 <i>11 units</i>
CMPE 30, ENGR 10, ME 20, MATE 25	
 <i>Required Courses in Engineering and Science</i> .....	 <i>50 units</i>
ISE 102, 105, 115, 120,130, 131, 135, 140, 142, 151, 155, 167, 170, 194, 195A, 195B; CmpE 131, ENGR 100W	
 <i>Approved Upper Division Electives</i> .....	 <i>6 units</i>
	<i>120 units</i>

## Sample Four-Year Program

(Total minimum units required for degree is 120)

### FRESHMAN YEAR: 28 units

<u>Fall</u>	<u>Units</u>	<u>Spring</u>	<u>Units</u>
Math 30	3	Math 31	4
Chem 1A	5	Phys 50	4
Engr 10*	3	Oral Communication	3
Engl 1A	<u>3</u>	Engl 1B	<u>3</u>
	14		14

### SOPHOMORE YEAR: 30 units

<u>Fall</u>	<u>Units</u>	<u>Spring</u>	<u>Units</u>
Math 32	3	MatE 25	3
Phys 51	4	ME 20	2
American Studies 1A	6	Math 123	3
CmpE 30	<u>3</u>	American Studies 1B	<u>6</u>
	16		14

Passing Writing Skills Test (WST) is required before taking Engr 100W

### JUNIOR YEAR: 30 units

<u>Fall</u>	<u>Units</u>	<u>Spring</u>	<u>Units</u>
ISE 102	3	ISE 131	3
Approved Technical Elective	3	ISE 120	3
ISE 130	3	ISE 142	3
Engr 100W	3	ISE 105	3
ISE 151	<u>3</u>	Approved Technical Elective	<u>3</u>
	15		15

All ISE senior courses require the completion of Engr 100W and Major Form on file

### SENIOR YEAR: 32 units

<u>Fall</u>	<u>Units</u>	<u>Spring</u>	<u>Units</u>
CmpE 131	3	ISE 115	3
ISE 135	3	ISE 155	3
ISE 140	3	ISE 195B	3
ISE 167	3	GE Area S or V	3
ISE 195A	1	ISE 170	3
GE Area S or V	<u>3</u>	ISE 194	<u>1</u>
	16		16

\* Transfer upper-division students may substitute an engineering science course for Engr 10.

# 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). Pre/Corequisites: MATE 025. 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: Cmpe, 30, 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. Corequisite: ISE 130. Lecture 2 hours/lab 3 hours. 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. 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. 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 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. 3units

**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. 3units

**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: Math 133A. 2 units.

**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.

**ISE 166. Healthcare Financial Engineering Management**

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, ISE 130 (with grade "C-" or better). 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 194. Data Analytics Workshop**

Application of common analytics programming languages to problems in industrial engineering. Prerequisite: CMPE 30, ISE 135, and Senior Standing. 1 unit

**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

# Engineering General Education Worksheet



Last Name (print) \_\_\_\_\_ First \_\_\_\_\_ Student ID # \_\_\_\_\_

Catalog Year \_\_\_\_\_ Major \_\_\_\_\_ Minor \_\_\_\_\_

Core General Education	Course	Units	Where Taken	Grade
------------------------	--------	-------	-------------	-------

**A. Basic skills (9 units)** Complete one course in each area. Categories marked with \* require a grade of C or better

A1	Oral Communication *			
A2	Written Communication 1A*			
A3	Critical Thinking *	----Pending Completion of Engineering Degree----		

**B. Science & Math (9 units)** Complete one course in each area. Categories marked with \* require a grade of C or better

B1	Physical Science	----Pending Completion of Engineering Degree----		
B2	Life Science	----Pending Completion of Engineering Degree----		
B3	Laboratory Science	----Pending Completion of Engineering Degree----		
B4	Mathematical Concepts *	----Pending Completion of Engineering Degree----		

**C. Humanities & Arts (9 units)** Complete one course in each area. Categories marked with \* require grade of C or better

C1	Arts			
C2	Letters			
C3	Written Communication 1B*			

**D. Social Sciences (9 units)** Complete one course in each category.

D1	Human Behavior			
D2	Comparative systems			
D3	Social Issues			

**E. Human Understanding & Development (3 Units)**

--	--	--	--	--

**Prerequisites to SJSU Studies**

Pass Writing Skills Test yes  N/C  Upper Division Standing yes  no

SJSU Studies	Course	Units	Where Taken	Grade
--------------	--------	-------	-------------	-------

Complete one course in each area.

Area R	Earth & environment	ENGR 100w		
Area Z	Written Communication II*	ENGR 100w		
Area S	Self, Society & Equality in the U.S.			
Area V	Culture, Civilization & Global Understanding			

Graduation Requirements	Course	Units	Where Taken	Grade
-------------------------	--------	-------	-------------	-------

**American Institutions**

F1	U.S. History			
F2	U. S. Constitution			
F3	California Government			

**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 documents 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)**

Dept	No.	Title	Unit	Grade	Dept	No.	Title	Unit	Grade
CmpE	30	Computer Engineering I	3		ME	20	Design & Graphics	2	
Engr	10	Engr. Process & Tools	3		MatE	25	Intro to Materials	3	

**REQUIRED COURSES (minimum 50 units)**

ISE	102	Engr Economic Systems	3		ISE	151	Managing Engineering	3	
ISE	105	Systems Engr & Activity Costing	3		ISE	155	Supply Chain Engineering	3	
ISE	115	Comp Integrated Manufacturing	3		ISE	167	System Simulation	3	
ISE	120	Work Methods Design & Mearmt	3		ISE	170	Operations Research	3	
ISE	130	Engineering Statistics	3		ISE	194	Data Analytics Workshop	1	
ISE	131	Statistical Process Contr. & Impvmt	3		ISE	195A	Senior ISE Design I	1	
ISE	135	Design of Experiments	3		ISE	195B	Senior ISE Design II	3	
ISE	140	Operation Planning & Control	3		Engr	100W	Engineering Reports	3	
ISE	142	Service Systems Engr & Mgmt	3		CmpE	131	Software Engineering I	3	

**APPROVED TECHNICAL ELECTIVES (minimum 6 units)**

--	--	--	--	--	--	--	--	--	--

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

Math	30	Calculus I	3		Phys	50	Mechanics	4	
Math	31	Calculus II	4		Phys	51	Electricity & Magnetism	4	
Math	32	Calculus III	3		Chem	1A	General Chemistry	5	
Math	123	Linear Alg & Differential Equations	3		Engl	1B	Argument and Analysis	3	

(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

Telephone					Email					Address				
U	Sem	Grade	Remarks		U	Sem	Grade	Remarks		U	Sem	Grade	Remarks	
Math 30	3				Math 31	4								
Chem 1A	5				Phys 50	4								
Engr 10	3				Oral Comm	3								
Enl 1A	3				Enl 1B	3								
CmpE 30	3				Math 123	3								
Math 32	3				ME 20	2								
Phys 51	4				MatE 25	3								
GE	3				GE	3								
GE	3				GE	3								
WST														
ISE 102	3				ISE 131	3								
Tech Elec.	3				ISE 120	3								
ISE 130	3				ISE 142	3								
Engr 100W	3				ISE 105	3								
ISE 151	3				Tech Elec.	3								
					Major Form									
CmpE 131	3				ISE 195B	3								
ISE 135	3				ISE 115	3								
ISE 140	3				ISE 155	3								
ISE 167	3				ISE 194	1								
ISE 195A	1				GE S or V	3								
GE S or V	3				ISE 170	3								

**Advisor Initials:** \_\_\_\_\_

**Advising Date:** \_\_\_\_\_

**Flag-off Initials:** \_\_\_\_\_

**Flag-off Date:** \_\_\_\_\_



## 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  
Mat/EE 129 Basic IC Processing  
MatE 130 Characterization and Analysis of Semiconductor Devices  
Mat/EE 167 Microelectronics Manufacturing Methods  
Mat/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 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