PROGRAM SELF-STUDY REPORT FOR THE MASTER OF SCIENCE IN ENGINEERING PROGRAM
FALL 2006

SUBMITTED BY:

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TO:
THE PROGRAM REVIEW PLANNING COMMITTEE
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SAN JOSE, CA 95192
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1. EXECUTIVE SUMMARY

This section includes general information about the MSE degree.

1.1. Degree Title

The title of the degree is Master of Science in Engineering. Current program options include:

- Biomedical Devices
- Engineering Management
- Environmental Health and Safety
- Electronic Materials and Devices
- Manufacturing Systems
- Microelectronic Packaging
- Special

DISCLAIMER: The program options were previously incorrectly referred to as concentrations. Several of the historical summaries in this document use that terminology to be consistent with their previous presentation. Concentration applications have been initiated for all of the options except Special and are currently undergoing University level review.

NOTE: MSE is housed in the College of Engineering and is considered the Master's level degree for General Engineering. General Engineering classes are noted with an ENGR suffix.

1.2. Contact Information

The program is housed in the Dean's office of the College of Engineering, room ENGR 491, with general telephone number 408/924-3968. Mailing address is:

- MSE Program, College of Engineering
- San Jose State University
- One Washington Square
- San Jose, CA 95192-0205.

The program Web Page is located at http://www.engr.sjsu.edu/ges/.
The program director is Dr. Michael B. Jennings, 408/924-3926 or Michael.Jennings@sjsu.edu and he reports to the Associate Dean for Graduate Studies Dr. Ahmed Hambaba, 408/924-3959 or Ahmed.Hambaba@sjsu.edu.
The Office Administrator is Kathy Robinson, 408/924-4048 or Kathy.Robinson@sjsu.edu.
1.3. Program Planning and Strategies Summary

Program planning is accomplished on an annual basis through meetings with faculty who participate in the program as instructors, program advisors, and/or as research committee members. Industrial representatives who participate on research committees are also invited to the planning meetings. Student input is obtained through surveys completed each semester, which are tuned to student progress in the program. Planning targets to meet the mission on the program include methods to optimize the curricula, areas for development of new programs, revisions to course delivery methods, and possible reconfiguration of project or thesis activities.

The strategy for program development is developed during the annual meetings and is based on available program resources.

2. PROGRAM PLANNING REVIEW REPORT

2.1. Last Program Planning Review

2.1.1. Primary Results of Previous Program Review

The most recent previous program review was conducted Spring 2003 within the College of Engineering by a task force appointed by the Dean. A copy of the final report from the MSE Task Force is attached as Appendix A. This group developed the following recommendations for the program:

2.1.1.1. Retain the MSE program as a self-supporting program that provides a base for interdisciplinary curricula, incubation for new programs for the COE, significant links to local industry and a marketing tool for the COE.

2.1.1.2. Continue to house the program in the office of the Dean with a tenure track faculty member as the program director. The program director should use the resources of an MSE Steering Committee to review and implement administrative and program development decisions.

2.1.1.3. Include the MSE program director in the Council of Chairs and utilize COE faculty for instruction and as members of student research committees.

2.1.1.4. Establish quality guidelines for all MSE concentration to assure quality education is a priority.

2.1.1.5. Confirm that all students in the program uniformly satisfy curricular and administrative conditions for their degrees.
2.1.2. Primary Results of Previous Program Self-Study

The last Self-Study review was conducted in the Fall 2001 semester under the direction of the Associate Dean of Graduate Studies and Research. Primary results from this review were:

2.1.2.1. Continue to develop new concentrations with some specific recommendations.
2.1.2.2. Continue to operate with available faculty from other programs and part-time faculty.
2.1.2.3. Support development of a joint doctoral program within the COE.
2.1.2.4. Prepare to accept larger numbers of graduate students based on the economic turn-down in the Valley.
2.1.2.5. Work with local industry to obtain laboratory and instructional resources.

2.1.3. Actions to correct Previous Weaknesses

2.1.3.1. One primary weakness defined in the previous program reviews was related to administrative organization. The program management had been shifted through a number of individuals since the inception and each had made modifications in procedures and operations. Appointment of an experienced tenured faculty member as program manager and the addition of an experienced administrative assistant allowed optimization of the program operating procedures. Many of the previous activities that required student appointments were converted to standardized documents that could be reviewed without the student present and this improved the administrative operating efficiency. The web site (http://www.engr.sjsu.edu/ges/) was modified to be more student-friendly and includes a FAQ’s page that is modified based on routine student requests.

2.1.3.2. A second primary weakness was the attempt to manage a high number of students with a minimum administrative staff. By 2003, the number of students in the program was above 500 and growing, which made it very difficult to provide the necessary services to students. Some of this pressure was relieved by the procedures outlined in the previous section but the major change was to shift two major incubated programs, Enterprise Software Technologies and Software Systems to the Computer Engineering Department. The program shifts provided some time to restructure and the number of students has come back to over 500 in the current time frame, with the addition of one new option and several more under consideration for development, based on student interest.

A significant off-campus derivative of the MSE program, which includes about 200 students, has been developed since the Fall 2001 report was issued. This off-campus operation consists of MSE/MBA programs.
shared with the College of Business and some specialty MSE programs provided at local industrial sites. A separate administrative component has been created to manage almost all of the off-campus activities with the exception of admission, reclassifications, and submission of candidacy requests.

2.1.3.3. A third weakness was in consistency of program administration due to the wide range of options and the large number of students. This deficiency was addressed by revising the configurations of the options to be more uniform and then applying guidelines in a consistent fashion.

2.1.3.4. An implied weakness in the previous reviews was expressed as a concern about educational quality, which has been interpreted as academic rigor. This deficiency has been addressed by using a majority of courses from the other departments to support the majority of the option courses. In addition, there has been a major change in the form of the project/thesis activities to make major use of members from local industry who have graduate degrees as project sponsors and committee members. This allows students access to available state-of-the-art resources, in terms of equipment and personnel, to complete their culminating experience. The inclusion of faculty members from SJSU as readers on the committee assures the projects/thesis meet standards for academic rigor and formats for formal reports.

2.2. Program Planning Overview

2.2.1. Assessment Life-Cycle Processes

Assessment for the MSE Program includes the following actions:

2.2.1.1. Each semester

Student Entry Surveys – for students in the first common core class, ENGR 201.
Student surveys of classes, instructors and the program.
Industrial surveys of students completing project courses, ENGR 298 or ENGR 299

2.2.1.2. Each year

Results of the semester surveys are correlated to provide an agenda for a program assessment retreat. Participants in the retreat are faculty who provide instruction, representatives from departments that supply courses used by the program, participants in project and thesis committees, and program administrators. The product of the retreat is a plan for activities for the following year.
2.2.2. Assessment Life-Cycle Matrix

The current plans for the Assessment Life-Cycle are to continue with the current semester surveys and annual assessment retreat as outlined in 2.2.1. This amounts to semester reviews for ENGR courses and an annual review of the overall program coordination activity. The MSE program utilizes a large number of courses from other Engineering, Science and Business programs. MSE students may participate in assessment of courses in the other programs, but MSE does not attempt to control content in those courses. There is a continuing dialogue with representatives from the programs that provide courses to support the MSE options to assure the most appropriate courses are being utilized. For example, new experimental courses from other programs can be included in the MSE curricula as they are initially presented. This dialogue allows a continuous review to assure the programs are contemporary in course content.

In addition, every two years there will be a component in the annual retreat to examine development of new programs and transfer of incubated programs to other departments. This session will examine the program as it relates to the rest of the university and to the developing needs of local industry.

2.3. Students

This section provides a profile of students included in the program.

2.3.1. Student Enrollment in the program

Enrollment data for the Last Five Years is taken from the Statistical Update web page from the Academic Planning section of the Office of the Provost (http://www.apb.sjsu.edu/Data_&_Reporting/statistical_update.cfm). All students are Graduate level and this listing does not include those in the off-campus programs. Note the major drop in 2004 when two of the options were transferred to the Computer Engineering Department.

<table>
<thead>
<tr>
<th>General Engineering Majors by Semester and Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALL</td>
</tr>
<tr>
<td>370</td>
</tr>
</tbody>
</table>
2.3.2. Student Sources

2.3.2.1. Direct Entry students come primarily from the Bay Area and include those working in local industry and other full-time students. Many are international students either on F-1 or HB visas that have either discovered the program on the Net or learned of it from current students or alumni. There are also many students who have domestic undergraduate degrees including a fraction who have degrees from SJSU.

2.3.2.2. The process for acceptance of New Students is to use the standard University sequence for all graduate students, followed by a review by the MSE program. The University review assures students have a degree from a four year institution and an acceptable grade point. The review in the MSE program is to confirm the student has adequate preparation in Engineering to complete the program. Students are accepted with a requirement for prerequisite courses when the option they select varies significantly from their undergraduate degree. Students who have a grade point below 3.0 are typically accepted on a conditional basis that requires them to obtain minimum B grades in all prerequisite courses and the first three option courses in the program.

2.3.2.3. Internal Transfer Students are those who come from the other Engineering programs and who find the MSE options more compatible with their degree objectives. There are also a number of students who are recruited after they apply to the Electrical Engineering program and meet all MSEE criteria except for the score on the GRE.

2.3.3. Program Orientation for New Students

2.3.3.1. New students receive orientation via the MSE web site (http://www.engr.sjsu.edu/ges/) which includes details for each option, FAQ's pages, and web links to University Graduate Studies and Research (http://www.sjsu.edu/gradstudies/) and other University sites such as the Class Schedules and the office for International Programs and Services. Students are alerted to these resources via a letter sent to them after they are admitted to the program.

2.3.3.2. The MSE program provides open Question and Answer sessions at least once each month to address student concerns. Questions from these sessions are often added to the FAQs page.

2.3.3.3. An e-mail list is maintained for all active MSE students and this can be used to distribute current information to students; such as new class offerings or changes in policies or procedures.
2.3.4. Student Advising

2.3.4.1. Most advising of students takes place through the MSE web site on the Net. There is a template for each option which includes the common and option core courses, plus electives attached to specific emphases. The emphasis elective courses are developed through coordination with the programs that supply courses to the MSE program. Students develop proposed Programs of Study from the option templates and submit these to the MSE Advisor for review and approval. Students are contacted by e-mail whenever their documentation is processed in the MSE office and a copy of the documents is placed in the student file. A separate memo is sent to students when a non-routine situation occurs and a copy of this memo is retained in the student file. Routine processing for changes on Program of Study, Reclassification, Application for Candidacy, changes to candidacy courses, and CPT and OPT references are also completed through written submissions to the MSE Advisor. General program information is transmitted to students via e-mail, using a data base that is maintained for students who are active in the program. This method is used to alert students to project opportunities that are received in the MSE office, new classes that may be available for their option, as well as other activities.

2.3.4.2. Additional student advising may be required for special situations; however, written requests are currently used for processing student academic probation and disqualification. Disqualified students receive personal interviews to review their reinstatement documentation and confirm they are aware of responsibilities associated with implementing these requests.

2.3.5. Monitoring Student Performance

2.3.5.1. Student Performance is monitored on the basis of GPA and those who go on probation are notified of their status. The majority of the courses taken by MSE students are provided by the other departments in Engineering, Business and Science. Since only a very small fraction of students end up on probation, it appears that MSE student performance is on par with students from the programs providing the courses.

2.3.5.2. Student performance is also monitored through the class surveys completed at the end of each semester for the ENGR classes. These ask the students to rate their abilities relative to the target outcomes for the program.
2.3.6. Process to Ensure All Students Meet All Program Requirements

2.3.6.1. MSE students must keep a current Program of Study on file with the MSE office and revisions are subjected to advisor review and approval. Acceptable courses for Programs of Study are listed on the MSE web page and students must petition for any variations from that list of courses.

2.3.6.2. MSE students are also required to file Candidacy Forms with the GS&R office and must complete the approved course list to graduate. Changes are subject to review and approval by the MSE advisor.

2.4. Program Educational Objectives

2.4.1. Constituencies

The groups served by the MSE program are in several categories, including graduate students, the College of Engineering, and local industry.

2.4.1.1. Graduate Students – the MSE program provides graduate students with the opportunity to complete a multidisciplinary degree that is valuable to developing industry. These programs use existing courses from other departments that are best suited for the objectives of the multidisciplinary degree. Most of the students who enroll in this program have BS degrees in Engineering or Science and many also have significant professional experience that helps define the preferred program content.

2.4.1.2. College of Engineering - the MSE program provides the College of Engineering with a convenient method to develop new programs either to meet current specific needs or as potential components to be added into existing departments. The level of COE resource commitment is minimized using the MSE program but it is adequate to allow programs to reach their development potential. The MSE program also provides positive publicity for the COE to the local community, in terms of contemporary program content and integrated project and thesis activity.

2.4.1.3. Local Industry – the MSE program allows a rapid response to needs of local industry beyond revisions to individual courses. In addition, the project/thesis basis for the MSE program encourages students to use the resources of local industry to complete the work. Support of these projects and theses gives local industry an opportunity to appreciate the skills and talents of COE students.
2.4.2. Program Mission

2.4.2.1. The mission of the MSE program is coordinated with the COE vision which is “To be a learning community that empowers its students to better the world through innovative applications of engineering knowledge and skills.” The MSE mission in support of this vision is to provide relevant interdisciplinary programs and to incubate new programs for the COE.

2.4.2.2. Implementing the MSE mission requires coordination with the other programs and departments in the COE and other Colleges that provide courses for MSE students.

2.4.3. Program Educational Objectives

Program Educational Objectives that apply to all options in the program are as follows:

2.4.3.1. Ability to function on multidisciplinary teams.
2.4.3.2. Ability to apply knowledge of mathematics, science and engineering.
2.4.3.3. Ability to communicate effectively.
2.4.3.4. Ability to use the techniques, skills, and modern tools necessary for engineering practice.
2.4.3.5. Ability to communicate effectively.
2.4.3.6. Understand the impact of engineering solutions in a global/societal context.

2.4.4. Program Outcomes for Graduate Program

Graduate student program outcomes that apply to all options are as follows:

2.4.4.1. Work collaboratively with various disciplines of engineering, science and business.
2.4.4.2. Can apply advanced theory and analysis for problem solving and synthesize and integrate information in the engineering process.
2.4.4.3. Can effectively communicate for problem analysis and solutions.
2.4.4.4. Can apply contemporary tools for computation, simulation, analysis and design.
2.4.4.5. Able to deliver effective presentation of engineering activities in written and oral formats.
2.4.4.6. Aware of the ethical, economic and environmental implication of my engineering activities.
2.4.5. Program Matrix for Learning Objectives and Program Outcomes

The matrix relating Learning Objectives and Program Outcomes is as follows:

<table>
<thead>
<tr>
<th>Learning Objective</th>
<th>A Graduate of the SJSU Master of Science in Engineering Program will be able to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 Ability to function on multidisciplinary teams.</td>
<td>Work collaboratively with various disciplines of engineering, science and business.</td>
</tr>
<tr>
<td>2.0 Ability to apply knowledge of mathematics, science and engineering.</td>
<td>Can apply advanced theory and analysis for problem solving and synthesize and integrate information in the engineering process.</td>
</tr>
<tr>
<td>3.0 Ability to communicate effectively.</td>
<td>Can effectively communicate for problem analysis and solutions.</td>
</tr>
<tr>
<td>4.0 Ability to use the techniques, skills, and modern tools necessary for engineering practice.</td>
<td>Can apply contemporary tools for computation, simulation, analysis and design.</td>
</tr>
<tr>
<td>5.0 Ability to communicate effectively.</td>
<td>Able to deliver effective presentation of engineering activities in written and oral formats.</td>
</tr>
<tr>
<td>6.0 Understand the impact of engineering solutions in a global/societal context.</td>
<td>Aware of the ethical, economic and environmental implication of my engineering activities.</td>
</tr>
</tbody>
</table>

2.4.6. Assessment of Program Objectives

Each of the MSE options could have a specific set of Program Objectives, which could be assessed by various entities.

2.4.6.1. Department Advisory Committee Evaluations

2.4.6.1.1. MSE Steering Committee – A committee comprised of faculty from various COE entities and industry has been used for a review of the program. Minutes of the most recent meeting area attached as Appendix B. The Program Objectives are discussed as a component of those meetings.

2.4.6.1.2. Industrial Advisory Council – There is not a formal Industrial Advisory Council for the entire MSE program. An Industrial Advisory Council does exist for the development of the Biomedical Devices concentration. The nature of the program is to develop curricula to provide graduate engineers for unique multidisciplinary positions that are not currently addressed in the other Engineering
programs. Since that target is constantly changing, it is difficult to staff an Industrial Advisory committee with interests outside of their specific area. Once a program is initiated, the participation of an Industrial Advisory council can be a valuable resource.

2.4.6.1.3. Employers – The employer component is addressed through the use of Industry sponsors for the student projects and theses. Discussions with these personnel during the period in which students are working on these activities can expose areas of deficiency in the MSE program. These concerns would normally be limited to the concentrations related to the specific study project. A copy of a formal survey document that is provided to industrial sponsors is attached as Appendix C.

2.5. Program Outcomes and Assessment

2.5.1. Graduate Program Curriculum and Professional Component

2.5.1.1. Curriculum Content – Student surveys are used to evaluate curriculum content each semester. A copy of the current form used for students in the project and thesis course is attached as Appendix D.

2.5.1.2. Preparation for Engineering Practice – Through the industry sponsored projects and theses, students are actually involved in engineering practice. These activities provide a current exposure to current engineering practice and methods.

2.5.1.3. Societal Need – MSE Projects and Theses are required to include an evaluation of their economic impact. This review requires an analysis of how the subject of their research will impact the local community. These impacts typically include an improvement of the quality of life through some application of technology.

2.5.2. Program Assessment Summary

2.5.2.1. Outcome Assessment Process Overview

The program assessment consists of planning for change, implementation, analyze to determine impact, qualify value of change, and revise program planning. This is a continuous cycle that is a necessary characteristic of a program like MSE; which is based on meeting short-term changing demands.

2.5.2.2. Outcome Assessment Design

The Assessment Outcomes are generic and apply to any student who completes the MSE degree. The graduate outcomes are summarized in the following table:
1.0 Students can work collaboratively with various disciplines of engineering, science and business.
2.0 Students can apply advanced theory and analysis for problem solving and synthesize and integrate information in the engineering process.
3.0 Students can effectively communicate for problem analysis and solutions.
4.0 Students can apply contemporary tools for computation, simulation, analysis and design.
5.0 Students are able to deliver effective presentation of engineering activities in written and oral formats.
6.0 Students are aware of the ethical, economic and environmental implication of their engineering activities.

Program outcomes are also assessed through reviews of interactions with the community. One of the primary objectives of the MSE program is to develop and maintain professional relationships with the local community. The goals of this objective are to provide specific student preparation to meet new technical opportunities and to have interaction between COE faculty and industrial professionals. The program is designed to meet this objective through the student projects/theses and the industrial participants are surveyed during the final defenses (See Appendix C for survey document.)

2.5.2.3. Outcome Assessment Methodologies

The primary tools for obtaining assessment outcomes data are surveys completed by students and industrial participants. Results of these surveys are correlated and sent to faculty for course revisions and used as the agenda for the program planning meeting. There is an attempt to include representatives of all program constituencies in the planning meeting to review results and recommend revisions.

2.5.2.4. Outcome Assessment Results

2.5.2.4.1. Entry student surveys

Entry student survey documents have been collected by the COE and results of these surveys are included as Appendix G. These results apply to MSE students, but have not been correlated as of the date of this report.

2.5.2.4.2. Course Surveys

An example of the data collected through the course surveys is included as Appendix E. The results of these surveys are returned
to the instructors for course revisions and results of the final questions, regarding program improvements, are used for the program planning meeting.

2.5.2.4.3. Alumni Survey Results

No alumni surveys have been developed to date for the MSE program. This is an area for future assessment and the primary questions should be similar to the program questions included in the other surveys; e.g., additional components for program courses, different priorities for program courses, new course recommendations, and new program option recommendations.

2.5.2.4.4. Employer Survey Results

The employer data is collected with the survey shown in Appendix C. We have collected that data during the Spring 2006 semester and will have a second data set at the end of the Fall 2006 semester. The data have not been compiled and correlated as of the date of this report, so there are no specific results beyond implementing the data collection.

2.5.2.4.5. Exit Survey and Project/Theses Results

Survey data collected from students at the end of the project/thesis courses have been reviewed and were discussed at the program planning meeting. The primary concerns were:
(1) The linkage between components in the common core courses and the project/thesis courses
(2) The impact of the WST sequence on completion of the program
(3) Some recommendations for new courses and options.

The COE has also collected exit data and this is included as Appendix F. This data has not been analyzed as of the date of this report, but it includes information that affects MSE students.

2.6. Data Analysis and Recommendations for Improvement

2.6.1. Data Collection
Data are collected each semester and analysis is scheduled for once each year.

2.6.2. Recommendations for improvement
Recommendations for improvement are obtained from the program planning meeting. The results of the last program planning meeting include recommendations for revisions as follows:
2.6.2.1. Better coordination between common core courses and project/thesis courses. This will require a separate meeting of faculty responsible for the courses involved.

2.6.2.2. Removal of the WST sequence for the GWAR so students can complete programs in a timelier manner. The WST was determined to be an impediment to graduate students because it is based on qualification for 100W, not 200W and is addressed towards US culture instead of the international cultures present in many of the MSE graduate student population.

2.7. Faculty

2.7.1. Full-Time Faculty
MSE will continue to use full-time faculty from other programs to the maximum extent for the technical courses. This assures rigor in the program and a participation by other programs in operation of MSE.

2.7.2. Part-Time Faculty
MSE will use part-time faculty for those courses that are not in the general areas of expertise for full-time faculty, especially in developing new programs.

2.7.3. New Faculty
MSE is not planning to hire new faculty at this time.

2.7.4. Faculty Professional Development
COE Faculty Professional Development is based on participation in MSE graduate project/thesis and the associated interaction with industrial sponsors. One objective of the industrial configuration for projects is to introduce faculty members of committees to industrial sponsors of student research, with the goal of establishing future research relationships.

2.7.5. Faculty Research and Scholarships
Research activities are supported via the student project/thesis industrial configuration, as described in the previous section. Students are not expected to have scholarship support for their industrial research, though the interaction should provide access to personnel and facilities.

2.8. Facilities

2.8.1. Teaching Classrooms
MSE uses general purpose teaching classrooms for common core and other ENGR courses. Project/thesis courses use Engineering and Industrial Studies classrooms equipped for student presentations. Specialty classrooms used for courses offered by other programs are used in coordination with the operation of those programs.
2.8.2. Teaching Laboratories
MSE has several laboratories available for common core courses, other ENGR courses, and project/thesis courses. These laboratories are also used by other Engineering programs to maximize their use. Specialty laboratories used for courses offered by other programs may also include MSE students.

2.9. Institutional Support and Financial Resources

2.9.1. Financial Resources
The MSE program is funded within the Dean’s office in the college of Engineering. Allocations for faculty positions are based on FTES. Allocations for administration and staff are included in the budget for the Dean’s office.

2.9.2. Instructional Support
There are no full-time faculty positions associated with the MSE program, therefore Engineering faculty report to their home departments for instructional support activities. Part-time faculties are typically hired to provide courses for developing courses that are not available from full-time faculty.

2.10. Interdependence of Programs

2.10.1. Service to SJSU
The MSE program provides a method for developing new programs that are not currently available in existing departments or that are multi-disciplinary and are not compatible with a single department. This function provides for a mechanism to quickly respond to changes in the local technical economy while limiting the risks of developing new programs within established departments. Many of the MSE alums are employed in the local community, so this program provides a positive promotion of SJSU to these entities.

2.10.2. Service to Programs in the College of Engineering
Most MSE options utilize courses from the established departments for at least one-half of the curriculum. The addition of MSE students to the courses provides an efficient way to operate the course without having to open additional sections. The project/thesis configuration with primarily industrial sponsors and faculty readers provides a good basis for faculty to develop relationships with local industry.

2.10.3. Service to Off-Campus Programs
The MSE program is linked to the off-campus programs in terms of development of new options. Some of the curricula developed for specific off-campus programs may be adopted as on-campus options. The on-campus and off-campus programs are operated as separate entities; so students cannot apply courses taken on-campus to off-campus programs and vice versa.
3. Program Planning and Strategies

3.1. Five Year Plan and Strategies Overview

3.1.1. Goals and Alignment with Program and College Missions

The COE mission statement, as listed on the web site at http://www.engr.sjsu.edu/overview.php, is: “We will provide empowering educational opportunities to students for their technical, professional and social development in a competitive and dynamic global society. We will build a vibrant community of students, faculty, staff, alumni, and industry professionals through strategic collaborations with Silicon Valley, California, national and global partners.” The MSE program supports this mission with the following specific activities:

3.1.1.1. Empowering educational opportunities are one of the primary driving forces for the MSE program. The options that are developed in the program are consistent with the needs of the local and the international community. The MSE graduate would normally interact with local industry while completing their project/thesis activity, related to a current subject of interest to the sponsoring entity.

3.1.1.2. Collaborations to build a vibrant community are developed through the project/thesis activities, by using local professionals to provide instruction, and through one industrial advisory committee for the BioMedical Devices concentration.

3.1.2. Mission of the MSE Program

The MSE mission is to provide relevant interdisciplinary programs and to incubate new programs for the COE.

3.1.3. List of Goals and Definitions – Program Planning Components

3.1.3.1. Students

The MSE program will provide program options that are contemporary with technical development and rigorous in content. All options except for the Special, are in the process of being reviewed for revision to concentration status to reflect the specific emphasis for the degree.

3.1.3.2. Faculty

The MSE program will interact to the maximum extent with faculty from the established programs at SJSU, as part of the COE community.

3.1.3.3. Staff

The MSE program will include experienced staff personnel to effectively manage the range and complication of activities.
3.1.3.4. Facilities
The MSE program will utilize facilities currently present in the COE as necessary to function. Facilities from the local community will be utilized to support student research activities.

3.1.3.5. Co-Curricular Programs
The MSE program will utilize courses from the established programs supplemented by new courses, as necessary to provide program options.

4. Strategies and Actions Plan

4.1. Coordination of courses through the program

4.1.1. Establish clear linkage between priority components in common core courses and project/thesis courses.

4.1.1.1. Responsibility – Faculty who provide instruction in common core and project/thesis courses
4.1.1.2. Resources – This effort will include a follow-up meeting to the program planning meeting.
4.1.1.3. Timeline – meeting should occur in the Spring 2007 semester with implementation in courses during Fall 2007 semester.
4.1.1.4. Success Metric – Improved quality of student performance in the project/thesis courses with respect to application of the priority components.

4.2. Revise GWAR Course

4.2.1. Provide a course to support the needs of the graduate students for project/thesis activities and minimize the time required to satisfy the GWAR.

4.2.1.1. Responsibility – Faculty who provide instruction ENGR 200W to prepare a new course syllabus. MSE administration to process the new course through the approval process.
4.2.1.2. Resources – This effort will use existing resources.
4.2.1.3. Timeline – New course to be approved in Fall 2006 semester with implementation in courses during Fall 2007 semester.
4.2.1.4. Success Metric – Most students shall have completed the GWAR in time to start project work by their third semester on campus. Improved quality of student performance in the project/thesis courses with respect to application of the components from the revised GWAR course.

4.3. Standardize the project and thesis options

4.3.1. Strengthen the course content of all options by elimination of the 6 unit project option and addition of another course to each option.
MSE PROGRAM SELF STUDY REPORT

4.3.1.1. Responsibility – MSE administration.
4.3.1.2. Resources – This effort will use existing resources.
4.3.1.3. Timeline – Last students in 6 unit project to complete their work by the end of Spring 2007 semester. 6 unit thesis option, over 3 semesters, is to be retained.
4.3.1.4. Success Metric – No students enrolled in 6 semester project sequence.

4.3.2. Improve web page to support the program
4.3.2.1. Provide better access to MSE on the COE web page
4.3.2.2. Provide more information to students regarding procedures and criteria to complete the MSE program
4.3.2.3. Provide a list of past projects as a guideline for development of new projects/theses
4.3.2.4. Responsibility – MSE administration in coordination with the program planning committee.
4.3.2.5. Resources – This effort will use existing COE internet resources and will require the support of a web technician.
4.3.2.6. Timeline – Modifications should be completed by the end of Spring 2007 semester.
4.3.2.7. Success Metric – Student comments on survey documents; which will require specific reference to value of web page.

4.3.3. Improve web page for outreach
4.3.3.1. Provide comments from alumni and industry representatives regarding value of the MSE program
4.3.3.2. Provide a list of feeder institutions
4.3.3.3. Responsibility – MSE administration in coordination with the program planning committee.
4.3.3.4. Resources – This effort will use existing COE internet resources and will require the support of a web technician.
4.3.3.5. Timeline – Modifications should be completed by the end of Spring 2007 semester.
4.3.3.6. Success Metric – Student comments on entry survey documents.

4.3.4. Improve Assessment Procedures
4.3.4.1. Revise and implement existing surveys
4.3.4.2. Complete analysis of surveys on a regular basis
4.3.4.3. Responsibility – MSE administration in coordination with the program planning committee.
4.3.4.4. Resources – This effort will use existing COE internet resources and will require the support of a web technician.
4.3.4.5. Timeline – Modifications should be completed by the end of Spring 2007 semester.
4.3.4.6. Success Metric – Student comments on entry survey documents.

4.3.5. Formal MSE Concentrations

4.3.5.1. Convert all MSE options, except for Special to formal concentrations that will be listed on the diploma.
4.3.5.2. Responsibility – MSE administration to submit concentration proposals after discussions with the program planning committee.
4.3.5.3. Resources – This effort will use existing COE structure and resources. Program documentation will be revised after the concentrations are approved.
4.3.5.4. Timeline – Concentrations should be approved by the end of Spring 2007 semester and implemented by the end of Fall 2007 semester.
4.3.5.5. Success Metric – This change is intended to attract students to the program, but it may not be practical to attribute enrollment changes exclusively to this factor. An attempt will be made to determine the impact using the entry survey documents.
Task Force Members
Fred Barez, MAE Department
Ahmed Hambaba, CmpE Department
Melanie McNeil (Chairperson), CME Department
Avtar Singh, EE Department

MAY 2003
# APPENDIX A:
MSE TASK FORCE REPORT AND RECOMMENDATIONS

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Appendix A: Collected Data

Appendix B: Original MSE Program Guidelines

Appendix C: Environmental Systems Marketing Brochure
EXECUTIVE SUMMARY

In January 2003, Interim Dean Belle Wei identified as a COE priority to examine the history of the MSE program, its current concentrations, objectives and quality management procedures and its relationship with other departments in the COE with the purpose of ensuring that the needs of the students, faculty and COE are being met and identifying areas of strengths and improvements. The MSE Task Force was formed (Fred Barez, MAE Department, Ahmed Hambaba, CPE Department, Melanie McNeil (Chairperson), CME Department, and Avtar Singh, EE Department) to carry out the task of evaluating the MSE Program and report their findings and recommendations to Interim Dean Wei by May 2003.

The MSE Task Force reviewed historical documents from the initial development of the MSE Program, current material contained in the 2002 MSE Graduate Program Planning Review Report, interviewed directors of four MSE Programs at other universities, interviewed seven past or current directors or administrators of the SJSU MSE Program or concentrations, and questioned the Council of Chairs and the faculty and staff of the COE about their perceptions and experiences with the MSE Program.

Recommendations

After evaluating all the collected information we have arrived at the following recommendations with the justification for each recommendation elaborated in the body of this report. The attached appendices contain support materials upon which we have based our justifications.

1. Retain the MSE Program and further develop it to ensure it is a self supporting quality academic program as well as a marketing tool and industrial partnership magnet for the COE. As articulated to the MSE Task Force by previous MSE Directors dating back to 1987 and in MSE Program brochures, the MSE Program mission is to establish closer ties with industry by providing a quality educational program based on interdisciplinary and subdisciplinary concentrations of relevancy to Silicon Valley and not provided by traditional engineering programs, to incubate new concentrations, and to include a significant business/management component. These goals also provide COE faculty the opportunity to develop new areas and curriculum.
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2. Continue housing the MSE Program in the Dean's Office under the Associate Dean for Graduate Studies and Research. Appoint a tenured COE faculty member to direct the MSE Program on a four year commitment with budgetary responsibilities (including an administrative assistant assuming the program continues with adequate students) and with priorities and responsibilities explicitly understood by the MSE Director, the COE Dean and the Council of Chairs. The job description for the position of MSE Director should be set up at the discretion of the Dean to include such responsibilities as MSE administration, student advising, Program marketing, faculty recruiting and evaluation and the like. Use the MSE Steering Committee, composed of tenure-track faculty actively participating in MSE concentrations with representation from the majority of COE departments, to make administrative and curricular decisions regarding the MSE Program and its concentrations and activities, in a role similar to traditional department faculty. The MSE Director should interact with the Steering Committee on all administrative and curricular issues, including concentrations, special concentrations, admissions, curriculum changes etc.

3. Involve the MSE Director, as appropriate, as a participant in the Council of Chairs meetings with a responsibility to report, for instance, on the numbers of MSE students taking classes in other departments, marketing efforts benefiting other departments, and partnership developments benefiting other departments. Re-establish links between COE faculty and the MSE Program including encouraging a larger number of COE faculty to teach MSE courses, and encouraging COE faculty to advise MSE students on their required final projects.

4. Re-establish quality guidelines for all concentrations in the MSE Program. Education is the priority.

5. Students receiving an MSE MS Degree, including those in incubated concentrations, follow the administrative and curricular requirements of the MSE Program.

NOTE: During the course of our investigation, we realized that COE minimal guidelines have not been established for any of the graduate programs regarding issues such as student acceptance requirements, thesis/project requirements and other program quality requirements (although departments have set up individual guidelines). While this issue is outside the scope of the MSE Task Force charge, we recommend that the COE Graduate Studies and Research Committee examine these issues and come up with minimal quality standards for all COE graduate programs. All COE student graduates have the potential of affecting the reputation of the COE and since their efforts affect the COE as a whole, it would be wise to have minimal COE quality standards to help ensure the good reputation of our graduates.
MSE Program History

Then Dean Jay Pinson developed the MSE Program in 1986 based on a perceived industrial need for multidisciplinary programs of interest to industry that were not provided by the traditional engineering disciplines. He also expected to use the MSE Program as a means to develop closer ties with industry. Initially a number of the MSE-related courses were offered at industrial sites such as IBM, National Semiconductor, Lockheed and what was then FMC. Working students appreciated the convenience of taking courses on or near their workplace and then were more committed to finishing their degree at SJSU. This also worked as a recruiting tool for students and industrial contacts. Initially the MSE Program had 20-30 students, it grew to over 500 students in the past 3 years and currently has approximately 400 students.

The intention of the MSE Program was to:

1. Provide interdisciplinary concentrations of relevancy to Silicon Valley (this was considered a primary purpose). It was perceived that Silicon Valley industry often requires engineers to have expertise that can’t be found in a traditional degree, but might span subject matter common to several traditional degrees, such as the Environmental Systems Concentration.
2. Provide subdisciplinary concentrations such as VLSI in which working engineers could return for their MS and develop depth in a certain desired area that a traditional degree could not offer due to the technical requirements of that degree.
3. Incubate new programs (this had the least priority) such as the Aerospace Concentration that developed into the MS Aerospace Degree.

Each concentration was developed with an overall systems approach, a managerial/business component and very applied subject matter. To meet the first two requirements, Engr 201, 202 and 203 were developed as required core courses.

Potential students were required to have a BS Degree in engineering or the physical sciences and even then were expected to take appropriate undergraduate engineering prerequisite courses as necessary. Without such a BS they were required to attain a second BS before entering the MSE Program.
Dean Pinson expected the MSE Program to be a cash center and, in fact it has been very successful in this area. According to Nabil Ibrahim, he MSE Program has created more resources per capita then any other COE program.

The Program was run out of the Dean’s Office. In 1987 Dean Pinson assigned Associate Dean Don Kirk the responsibility of running the Program. Guna Selvaduray was assigned as Associate Director. In 1990 Nabil Ibrahim took over as Associate Dean of Graduate Studies and Research and thus, assumed responsibility for the MSE Program. After a few years he appointed Walter Utz as the MSE Program Director. Upon Dr. Utz’s untimely death, Ahmed Hambaba briefly took charge of the MSE Program followed by Ali Zhargar who was the MSE Director for several years. He was followed by Jim Dorosti who has been the MSE Director for the past two years. It is also noteworthy that Dan Harkey has been significantly involved for the past seven years in the development of the Client/Server concentration, one of the most successful concentrations to date. Dan had primary responsibility in this development and was awarded the Jay Pinson Process Engineering Chair in recognition of the importance of this concentration and to facilitate Dan’s previous efforts in the development of this concentration.

JUSTIFICATION FOR RECOMMENDATIONS

Recommendation 1. Retain the MSE Program and further develop it to ensure it is a self supporting quality academic program as well as a marketing tool and industrial partnership magnet for the COE. As articulated to the MSE Task Force by previous MSE Directors dating back to 1987 and in MSE Program brochures (see appendix A), the MSE Program mission is to establish closer lies with industry by providing a quality educational program based on interdisciplinary and subdisciplinary concentrations of relevancy to Silicon Valley not provided by traditional engineering programs, to incubate new concentrations, and to include a significant business/management component. These goals also provide COE faculty the opportunity to develop new areas and curriculum.

The Silicon Valley is one of the leading edge technology producers in the world. Cutting edge technology efforts often start in the hot bed of industrial R& D centers, entrepreneurial startups, and government labs that populate the area. The COE has committed to working with our industrial and governmental neighbors and thus, must be
able to demonstrate the ability to meet the swiftly changing needs of these technology creators.

Overwhelmingly the evidence from all our sources shows that the MSE Program is most able to demonstrate that the COE can meet the educational needs demanded by emerging technologies. The MSE Program is much more flexible than traditional degree programs. It can adjust quickly to new market trends and present new concentrations on a real time basis, demonstrating to industry that San Jose State University can meet their evolving needs. This has been shown in the past by the development of concentrations such as VLSI Design and Client/Server and could be shown in the future by nanotechnology, biotechnology and other cutting edge concentrations. Note that the Client/Server Concentration wouldn’t be in existence today without the MSE Program since the Computer Engineering Department declined to develop it when it was originally offered the opportunity. It is relatively common that a traditional degree program will not have the resources and/or faculty to devote to the development of emerging technologies which usually comes at the expense of their traditional degree students and traditional degree curricular requirements.

The ability to develop and market industrially important concentrations allows the COE to open the door in developing new industrial partnerships. Industry wants to support educational degrees that are beneficial to their needs and will be more open to supporting the COE if we provide qualified graduates. The MSE Program can help open the door to industrial partnerships that will benefit other departments in the COE. Although not initiated by the MSE Program, an example of how this can work can be observed in the ongoing development of the nanotechnology research partnership with NASA.

The successful marketing of MSE Program concentrations will increase the focus of potential students on SJSU as their university of choice which will help draw students to other COE departments as well as the MSE Program. It will also focus the attention of industry on SJSU and help us achieve our goal of being a preferred partner for
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research partnerships, funding partnerships, and premier provider of qualified graduates as employees.

As articulated to the MSE Task Force by previous MSE Directors dating back to 1987 and in MSE Program brochures (see appendix A), the MSE Program mission is to establish closer ties with industry by providing a quality educational program based on interdisciplinary and subdisciplinary concentrations of relevancy to Silicon Valley not provided by traditional engineering programs, to incubate new concentrations, and to include a significant business/management component. These goals also provide COE faculty the opportunity to develop new areas and curriculum.

The MSE Program has shown that it can be self-supporting, that it can effectively recruit new students to a variety of concentrations relevant to Silicon Valley industries and that it can be used as a tool to initiate industrial contacts. These are all high priorities for the COE and the MSE Program can be a key tool to help the COE meet its future enrollment, program recognition and funding targets.

Recommendation 2.
Continue housing the MSE Program in the Dean’s Office under the Associate Dean for Graduate Studies and Research. Appoint a tenured COE faculty member to direct the MSE Program on a four year commitment with budgetary responsibilities (including an administrative assistant) and with priorities and responsibilities explicitly understood by the MSE Director, the COE Dean and the Council of Chairs. The job description for the position of MSE Director should be set up at the discretion of the Dean to include such responsibilities as MSE administration, student advising, Program marketing, faculty recruiting and evaluation and the like. Use the MSE Steering Committee, composed of tenure-track faculty actively participating in MSE concentrations with representation from the majority of COE departments, to make administrative and curricular decisions regarding the MSE Program and its concentrations and activities, in a role similar to traditional department faculty. The MSE Director should interact with the Steering Committee on all administrative and curricular issues, including concentrations, special concentrations, admissions, curriculum changes etc.

The lack of recognition of the MSE Program as an equal partner in the COE has led to a number of challenges the Program is currently facing. Part of the lack of recognition is due to the fact that the Program is not in a traditional department structure, it has a heavy dependence on part-time instructors due to lack of full time
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Due to the needs for flexibility, continual curriculum development, and multidisciplinary concentration emphases, continued housing of the MSE Program in the Dean’s Office under the Associate Dean for Graduate Studies and Research is a reasonable compromise. As noted by several of our interviewees, housing the MSE Program in any given department would lead to it becoming more like that department which would defeat the goals of the Program and would diminish the marketing and fundraising potential for the COE. For instance, at USC, the MSE Program is housed in the Industrial Engineering Department and students are required to take 18 units of ISE courses as part of the 30 units required for the degree. Even if a department wouldn’t start with this kind of requirement, it is clear that most likely, over time, it would tend to make resource and other decisions that would result in this type of outcome, defeating the objective of having a truly multidisciplinary program and thus, a marketing tool for the COE.

It is clear that the MSE Director is required to be a strong champion for the Program, all past directors have shown this attribute. The MSE Task Force recognizes the dedication and efforts beyond the call of duty demonstrated by non-tenured MSE Program directors and urges the COE to continue to find significant roles for such dedicated colleagues. It is clear that all directors have had a passion for ensuring the success of the MSE Program. However, given the responsibilities of curricular and quality oversight, as well as collaboration and negotiation with other COE Departments and the Dean, the MSE Program would be best served by a director who is a tenured faculty member with a four year commitment and budgetary responsibilities similar to Department Chairs, with priorities and responsibilities explicitly understood by the MSE
APPENDIX A:
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Director, the COE Dean and the Council of Chairs. The other MSE Programs at the four Universities interviewed by the MSE Task Force all had a tenured faculty member as director, often a faculty member who had previous experience as Department Chair. The MSE Program Director position would give a tenured faculty member the opportunity to get administrative experience, which could be of later advantage to the COE as well as the Director.

It should be noted that at other universities with MSE Programs as large as in the COE, a minimum of one fulltime administrative assistant was allocated to the MSE Program. Given the current size and ongoing potential for student growth (as new concentrations develop) in the COE MSE Program, a fulltime administrative assistant would be a wise investment (given adequate student enrollment).

As with a traditional program, various administrative and curricular decisions must be continually decided. In traditional departments these decisions are made by the faculty in consultation with their Chair with some decisions being reviewed by the Dean or Associate Dean. A similar structure is recommended for the MSE Program. The MSE Steering Committee, composed of tenure-track faculty actively participating in an MSE concentration with the majority of the departments represented, could serve the same purpose. This Committee should continue to be dominated, or even populated exclusively, with tenured or tenure-track faculty because such faculty know department standards and can ensure that the MSE Program meets equivalent standards. Such faculty have the long term commitment to the COE and will have a greater stake in ensuring that quality standards are met.

The described administrative structure would give the MSE Program some permanence and administrative credibility in the COE. This will insure that informed decisions in the best interests of the MSE Program, not other various groups, will result. As each traditional department has shown, it is the department faculty who have the best interests of the department at heart, in conjunction with the Dean, that make the best decisions for their department. The MSE Program requires the same support.
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**Recommendation 3.**

Involve the MSE Director as a regular participant in the Council of Chairs meetings with a responsibility to report, for instance, on the numbers of MSE students taking classes in other departments, marketing efforts benefiting other departments, and partnership developments benefiting other departments. Re-establish links between COE faculty and the MSE Program including encouraging a larger number of COE faculty to teach MSE courses, and encouraging COE faculty to advise MSE students on their required final projects.

One common concern voiced by several faculty members is that the MSE Program does not have enough ties to existing departments. During our investigation it appeared that the MSE Program did have ties to the departments but they weren’t obvious due to lack of communication. For instance, all MSE students take classes in other COE departments outside of General Engineering adding FTE numbers to those departments. These numbers could be regularly reported. In addition, the MSE program has developed a prototype marketing brochure for some concentrations, such as the Environmental Systems Concentration brochure shown in Appendix C, which also markets the Environmental Engineering emphases in Chemical Engineering and Civil Engineering and describes the differences between each program so that a student can choose the program which best meets his/her needs. This type of brochure could be developed for other concentrations with overlapping interests in traditional departments.

We recommend that the MSE Program Director be a regular participant in the Council of Chairs meeting so that information can be disseminated and MSE activities can be visible to all COE faculty through reports from their Chair. The Director could then regularly report on the numbers of MSE students taking classes in other departments, marketing efforts benefiting other departments, and partnership developments benefiting other departments.

COE tenured or tenure-track faculty, particularly those involved with MSE Concentrations, can be encouraged to teach MSE courses. The academic oversight that tenured faculty can provide and the ownership that results from teaching courses...
are important to ensuring quality standards are being maintained as well as links between the MSE and COE faculty are maintained.

**Recommendation 4.**

Re-establish quality guidelines for all concentrations in the MSE Program. Education is the priority.

One of the continuing challenges faced by the COE MSE Program and those at the other universities we interviewed was keeping the quality of the students and curriculum at desired high standards. Some of the difficulties stem from large numbers of students, large number of part-time instructors, and perceived differing priorities between various concentrations. The Program quality should be maintained across the entire program and evaluated for the entire program in a manner similar to ABET Program evaluation.

Across the board, everyone we interviewed agreed that high student entrance requirements must be set and maintained (although there were differences in opinion on what those guidelines should be). One criteria used by other MSE Programs and an original requirement of the COE MSE Program is that since successful graduates from the MSE Program will receive an engineering degree, potential students must have a BS in engineering or the physical sciences or, in some cases math, so that they will have the foundation for the career they are targeting. MSE Programs we reviewed mentioned that they experienced problems whenever they accepted students without engineering or science degrees including those programs who accepted business students or students with working experience but without engineering or physical science BS degrees.

In fact, the COE MSE Program was developed with an emphasis on such quality guidelines, however the requirements were misplaced probably during some of the unexpected changes in directorship over the years. The MSE Task Force recommends
that these guidelines, shown in Appendix B, can be reinstated. They include requirements for students to have an engineering degree or physical science degree (including some math degrees) with a minimum GPA of 2.75 in technical courses, otherwise they are required to obtain an appropriate second baccalaureate degree with the same minimal GPA requirement first. Students with a physical science degree (but non-engineering) are required to take three semester of calculus plus one semester of advance math (e.g. differential equations, discrete math, etc.) and two other engineering courses from the COE undergraduate common core course list all with a grade of B or better before taking any MSE Degree courses (the original MSE requirements required differential equations however the advanced math requirement is expected to be different for different concentrations).

Although some students might be able to get through the MSE Program without the recommended required background, it must be understood that the MSE Program is not providing training, but education, and the students must leave with the tools that will allow them to be a successful engineer to solve not only today’s problems, but have the necessary foundation to solve tomorrow’s problems as well. The degree requirements can be reviewed and changes may be required to stay current, however the changes should be proposed and accepted by the majority of the MSE Steering Committee who will have the best interests of the MSE Program in mind as well as the academic standards quality commitment of the Program. Each concentration can have course additional prerequisite requirements, but the minimal requirements should apply to all MSE students.

As for any department program, it is reasonable to set core courses that all MSE students are required to take. As detailed in the history section, each MSE concentration was developed with an overall systems approach, a managerial/business component and very applied subject matter in the concentration. To meet the first two requirements, Engr 201, 202 and 203 were developed as required core courses. The MSE Steering Committee is responsible for implementing changes to the core, including the identity of the required core courses, and for periodically reviewing core course content to ensure that students are receiving a common and relevant background.

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Tenure-track and/or tenured faculty are strongly encouraged to teach as many MSE courses as possible to provide curricular oversight. These faculty will ensure that COE standards are upheld and have the vision to ensure that the concentrations focus on education and not vocational training. Part-time faculty in collaboration with tenure-track faculty can develop course and concentration requirements, and their expertise can be used to deliver these rigorous and relevant courses.

The final project was designed to be a rigorous, applied project and is a final check on the quality of the student (and the Program). The original requirements are contained in Appendix B and indicate the rigor and evaluation procedure used to maintain the quality of the projects. These guidelines can change, but again, the changes should be proposed and accepted by the majority of the MSE Steering Committee. Historically, faculty serving as MSE Project Advisors received 3 units release time for every 5-8 completed projects advised. This or like practice should continue, with agreement of the Council of Chairs to make sure their departments will be positively impacted, to be used to motivate faculty to serve in this important process.

**Recommendation 5.**

*Students receiving an MSE MS Degree, including those in incubated concentrations, follow the administrative and curricular requirements of the MSE Program.*

The MSE Program has had relatively few programs to date that have been incubated and then moved to a traditional department. There do not seem to be any MSE Program guidelines to facilitate this transfer. However, this is the sort of administrative detail appropriate for the MSE Steering Committee to develop. The Steering Committee may want to consider the use of distance education and industrial-site course offerings to off-set enrollment changes when a concentration moves to a department. Other universities have used the former and initially the COE MSE Program used the latter, to increase enrollment as appropriate.
All students receiving an MSE MS Degree, even those in incubated concentrations, are required to follow the administrative and curricular requirements of the MSE Program. This is a recognized outcome for all degree granting programs. The quality of the Program and Degree would be compromised if students were to receive an MSE degree without meeting the stated requirements of that degree, just as it would be if a student received a degree in any traditional department for which they had not met the stated requirements. The importance of this fact is made clear by the amount of time at the undergraduate level ABET reviewers spend on making sure each student meets the stated requirements for each undergraduate degree program. The COE is guaranteeing that requirements are met for all degree granting programs and it is obvious that the reputation of the COE would be compromised in the educational community if a practice were made of giving degrees without the requirements of the degree being met.

SUMMARY
The MSE Program was developed as an experiment to develop closer ties with industry, generate resources (student enrollment etc.) and develop multidisciplinary curriculum of interest to the surrounding Silicon Valley. The latter goal also give faculty the opportunity to develop new areas and curriculum. As appropriate for its experimental mode, the MSE Program did not have a structure that would give it a permanent and recognized position in the COE.

The MSE Program has shown that it can be a self supporting, that it can effectively recruit new students to a variety of concentrations relevant to Silicon Valley industries and that it can be used as a tool to initiate industrial contacts (this is also backed up by the experience of the MSE Programs at the other universities we interviewed). These are all high priorities for the COE and the MSE Program is uniquely positioned to help the COE meet its future enrollment, program recognition and funding targets.

It is time for the MSE Program to move from an experimental mode to a permanent structure if it is to become an equal partner in the COE. Without this change
it will be difficult to maintain quality and academic standards, and will have the potential to damage the COE’s reputation. Since the MSE Program has been in existence for over 15 years, much of the underlying structure is in place, it just needs to be recognized and supported. The implementation of our recommendations will provide the necessary administrative structure for the MSE Program. From this place of solidarity, the MSE Program can reach out to other COE and SJSU departments and the community and establish itself as one of the preeminent programs in the COE.
APPENDIX B - MSE PROGRAM ASSESSMENT

General Engineering Retreat Meeting Minutes

DATE: Wednesday October 25, 2006
TIME: 1:00PM until 4:00PM
LOCATION: SJSU Associated Students (AS) House

PARTICIPANTS: Mike Jennings, Kathy Robinson, Jim Dorosti, Guna Selvaduray, Yasser Dessouky, Niranjani Patel, Jeanne Linsdell, Gilda Pour, Leonard Wesley (Scribe)

MINUTES:

REVIEW MSE PROGRAM OBJECTIVES

MJ: Jennings opened with a review and summary of General Engineering’s (GEs) MSE program objectives, administration, and assessment. It was noted that GE incubates several multi-disciplinary degree specialty and concentration programs. The desired emphasis of the retreat is to discuss how best to manage MSE programs of study.

GWAR REQUIREMENTS

JL: Jeanne Linsdell noted that the number of ENGR 200W sections has dwindled from seven (7) to one (1). This is due in part to COE departments developing their own technical writing courses. Linsdell pointed out that the university graduate writing studies committee expressed concern regarding a decline in the quality of students’ writing skills. It was pointed out that students tend to demonstrate a better success rate at passing the WST by taking two semesters of writing instead of taking the WST multiple times.

Action Item: MJ: ENGR is creating a writing course that includes project/thesis components, primary writing skills, and does not require passing the WST as a prerequisite.

REVIEW MSE PROGRAM ADMINISTRATION

GS + YD: Guna and Yasser commended GE and the MSE program for the ENGR281 (1 unit)/ENGR298 (2 unit) project track, and the ENGR281 (1 unit)/ENGR299 (2 unit)/ENGR299 (3 unit) thesis track that provides sufficient time for students to actually complete their project/thesis rather than receive a grade of incomplete for a one semester project/thesis course.

MJ: Noted the challenges of administering a program of ~600 students with limited resources. He summarized the stream-lining of the admission and advising process to
fit within current time and budget constraints. The advertisement of the MSE programs and concentrations are primarily web-based.

**Action Item:** MJ: Get better MSE references on the COE entry Web Page.

JD: Probed the idea of seeking additional resources to maintain and possibly grow the number of MSE students.

**Action Item:** LW: Mentioned that it might be useful to post web-links to MSE information at international sites and forums that are visited frequently by foreign students.

YD: Important to advertise and recruit just to maintain enrollment levels at minimum of two sections of Common Core Courses each semester. MJ: Noted that student late registration resulted in uneven numbers of students in common core classes this semester.

**Action Item:** MJ: There are plans to post summaries of project and theses on the web.

### SUMMARY OF CURRENT ASSESSMENT METHODS AND RESULTS

MJ: Current assessment activities involve collecting survey data from class surveys, exit surveys, and culminating experience impressions. Entrance surveys are being prepared but have not been implemented yet.

**Action Item:** MJ: Plan to use Entrance Survey in ENGR 201 instead of the current class survey.

GS: Some of the data and information used to evaluate the MSE program and to identify areas for improvement come from surveys. Guna noted the importance of structuring survey questions appropriately. He suggested getting assistance, from within SJSU, with developing the survey.

MJ: Noted that an area of assessment in course surveys that continues to receive relatively low scores (i.e., a score of 4.0 in a range of 0 (lowest) to 6 (highest) in response to students’ level of agreement with the statement, “I can apply contemporary tools for computation, simulation, analysis and design.” GP: This might be due to many factors, one of which being the diversity of tools in different disciplines.

### REVIEW PROGRAM GOALS

MJ: Summarized the new and related courses to be added as reflected in “new student,” “mid degree,” and “finishing” student inputs. See slides numbered 30 to 35 for more details. More engineering management, industry speakers, and new products topic areas were highlighted in the meeting as some of the inputs provided by students.

YD: Mentioned some courses offered in ISE that can meet this need. Mike also summarized the comments and suggestions for improvements from the same three categories of students. LW: Mentioned a need for MSE students to develop the skills to prepare and give presentations to non-technical types.

**Action Item:** Second Semester Project: Have at least one of the status reports presented in the form of an Executive Summary.
PLAN TO MEET GOALS

MJ: Mentioned the need to incorporate an appropriate level of economic justification into project reports; which requires applications of Engineering Economics, some basic marketing concepts, and other components that would be included if the projects would be subjects of a business plan. Also discussed were the need to have students capable of using applied statistics and Design of Experiments. The topics of ENGR201, ENGR202, and ENGR203 were briefly reviewed to explore if and where these components could be incorporated. JD: Topics are already included to some extent, but there needs to be a change in emphasis to meet the needs of the project/thesis activities. YD: Pointed out that ISE covers the traditional engineering economic analysis topics in one of its courses.

**Action Item:** MJ: An action item is to make a clear statement of what the GE program wants MSE students to have in the way of economic justification knowledge and skills.

**Action Item:** MJ: Need to have a separate meeting with ENGR201, ENGR202, and ENGR203 instructors and project/thesis instructors to review and discuss adjustment of the common core courses to provide the background MSE students need to be able to develop and incorporate economic justifications into their project reports.

MEETING AJOURNED AT 4:00PM

Attachment – Outline of Retreat Presentation
AGENDA OUTLINE FOR DISCUSSION

ORGANIZATION OF PRESENTATION FOR RETREAT
SUMMARIZE THE CURRENT STATUS OF THE PROGRAM
SUMMARY OF ASSESSMENT TO DATE
DEVELOPMENT OF RECOMMENDATIONS FOR IMPROVEMENT

MEETING OBJECTIVES

REVIEW MSE PROGRAM OBJECTIVES
REVIEW MSE PROGRAM ADMINISTRATION
SUMMARY OF CURRENT ASSESSMENT METHODS AND RESULTS
REVIEW PROGRAM GOALS
PLANS TO MEET GOALS

SECTION 1 - CURRENT PROGRAM STATUS

WHAT DO WE DO
HOW DO WE DO IT
HOW WELL IS IT WORKING

MSE PROGRAM OBJECTIVES

PROVIDE MULTI-DISCIPLINARY DEGREES
ENVIRONMENTAL HEALTH & SAFETY
BIOMEDICAL DEVICES
SPECIAL CONCENTRATIONS
BIOINFORMATICS
NETWORKING

MSE PROGRAM OBJECTIVES

INCUBATION OF NEW GRADUATE DEGREES
ELECTRONIC MATERIALS & DEVICES
ENGINEERING MANAGEMENT
MANUFACTURING SYSTEMS
MICROELECTRONIC PACKAGING

PROVIDE GRADUATE SERVICE COURSES
ENGR 200W – ENGINEERING REPORTS

MSE PROGRAM STRUCTURE

DEFINED CONCENTRATIONS
PROGRAM COMMON CORE - GENERAL
CONCENTRATION CORE - SPECIFIC
CONCENTRATION ELECTIVES – MORE SPECIFIC
GRADUATION WRITING ASSESSMENT REQUIREMENT (GWAR) - GENERAL
PROJECT OR THESIS – MOST SPECIFIC

MSE PROGRAM OBJECTIVES

STUDENT OUTCOME ATTRIBUTES
WORK COLLABORATIVELY WITH VARIOUS DISCIPLINES
APPLY ADVANCED THEORY AND ANALYSIS TO ENGINEERING PROCESSES
EFFECTIVE COMMUNICATION FOR PROBLEM ANALYSIS
APPLY CONTEMPORARY TOOLS
APPENDIX B – MSE ASSESSMENT RETREAT MINUTES OF MEETING

EFFECTIVE VERBAL AND WRITTEN TECHNICAL COMMUNICATION
AWARENESS OF ETHICAL, ECONOMIC AND ENVIRONMENTAL ASPECTS OF ENGINEERING
LINKAGE TO LOCAL INDUSTRY
FOR RESEARCH SUPPORT
FOR PLACEMENT OF STUDENTS

PROGRAM COMMON CORE
PROVIDE THE MULTI-DISCIPLINARY CONTENT FOR ALL CONCENTRATIONS
ENGR 201 - ENGINEERING ANALYSIS
GRADUATE MATH AND STATISTICS
ENGR 202 - SYSTEMS ENGINEERING
SYSTEMS DESIGN AND OPTIMIZATION METHODS
ENGR 203 - ENGINEERING MANAGEMENT
MANAGEMENT STRUCTURES AND METHODS FOR TECHNICAL ORGANIZATIONS

CONCENTRATION CORE
REQUIRED COURSES FOR THE CONCENTRATION
TYPICALLY 3 COURSES
TRY TO INCLUDE AT LEAST 5 COURSES TO ASSURE AVAILABILITY
DEFINED BY THE PROGRAMS THAT SUPPORT EACH CONCENTRATION
MAJORITY OF FTES GO TO SUPPORTING PROGRAMS

CONCENTRATION ELECTIVES
ELECTIVE COURSES FOR THE CONCENTRATION
TYPICALLY 3 COURSES
ARRANGED BY EMPHASES DEFINED BY THE SUPPORTING PROGRAMS
MAJORITY OF FTES GO TO SUPPORTING PROGRAMS

GRADUATION WRITING ASSESSMENT REQUIREMENT
REQUIRED FOR AT LEAST 95% OF THE MSE STUDENTS
HIGH FRACTION OF STUDENTS ARE INTERNATIONAL
REQUIRED AS A PREREQUISITE FOR PROJECT/THESIS COURSES
NORMALLY SATISFIED WITH ENGR 200W
3 UNIT COURSE DOES NOT COUNT IN THE CANDIDACY LIST FOR THE DEGREE
COURSE IS DESIGNED TO SUPPORT PROJECT ACTIVITY
LITERATURE SEARCH METHODS
PREPARATION OF SCOPE
FORMATTING FOR FINAL REPORTS
PLAGIARISM CONSTRAINTS
CURRENT VERSION REQUIRES WST

PROJECT OR THESIS
REQUIRED FOR GRADUATION
EXPERIMENT WITH CUMULATIVE EXAM WAS A FAILURE
3 UNIT PROJECT CURRENTLY APPROVED – ENGR 281/ENGR 298
6 UNIT THESIS ALSO ACCEPTED – ENGR 281/ENGR 299/ENGR 299
PROJECTS/THESIS SIMILARITIES
APPENDIX B – MSE ASSESSMENT RETREAT MINUTES OF MEETING

INDUSTRY SPONSORED
INCLUDE ECONOMIC AND TECHNICAL JUSTIFICATION
MAY BE DONE IN TEAMS
USE APA FORMAT FOR FINAL REPORTS
HAVE FULL DEFENSES
DIFFERENCES
THESIS MUST BE PUBLISHABLE
THESIS MUST BE APPROVED BY GS&R
PROJECT OR THESIS
COMMITTEE STRUCTURE
INDUSTRY SPONSOR PROVIDES
PRIMARY TECHNICAL GUIDANCE
ACCESS TO NECESSARY RESOURCES
REVIEWS MOST ASSIGNMENTS AND PROGRESS REPORTS
BEFORE SUBMISSION
ACADEMIC READER PROVIDES
ASSURANCE OF PROJECT RIGOR
CONFORMANCE TO REQUIRED FORMAT
BOTH PARTICPATE IN ACCEPTANCE OF SCOPE AND
PRESENTATION OF DEFENSE
THESIS REQUIRES SECOND ACADEMIC MEMBER
MAKES MINIMUM USE OF FACULTY WHILE ASSURING QUALITY
VARIATIONS FOR SPECIAL CONCENTRATION
NO REQUIRED CONCENTRATION CORE COURSES – 6 ELECTIVES
CRITERIA FOR ACCEPTABLE PROGRAM
STUDENT MUST SUBMIT AN OVERALL OBJECTIVE
MUST SHOW LINKAGE BETWEEN COURSES AND OBJECTIVE
ARE REVIEWED WITH KNOWLEDGEABLE FACULTY TO CONFIRM
COURSE SELECTION
MSE PROGRAM ADMINISTRATION
STUDENT ADMISSION
STUDENT ADVISING
PROGRAM PROMOTION
STUDENT ADMISSION
STUDENTS APPLY THROUGH A & R
MUST SATISFY UNIVERSITY CRITERIA
MUST SUBMIT DOCUMENTATION
STUDENTS DOCUMENTS ARE REVIEWED FOR MSE ADMISSION (ON WEB)
CONFIRM UNDERGRADUATE PREPARATION
CONFIRM CONCENTRATION SELECTION
ADMITTED STUDENTS (BY E-MAIL AND WEB)
DEFINE NECESSARY PREREQUISITES FOR GS&R LETTER
REQUEST PROPOSED PROGRAM OF STUDY IN PROGRAM LETTER
START STUDENT FILE IN MSE
ADD STUDENT TO MSE DATA BASE FILE, INCLUDING E-MAIL ADDRESS
STUDENT ADVISING
APPENDIX B – MSE ASSESSMENT RETREAT MINUTES OF MEETING

PROGRAM OF STUDY
- REVIEW SEQUENCE UNTIL APPROVED
- MAY REQUIRE CONSULTING WITH OTHER PROGRAMS FOR CERTAIN COURSES

GENERAL ORIENTATION
- Q AND A SESSIONS HELD AT LEAST ONCE PER MONTH DURING FALL & SPRING
- NOTICES REGARDING COURSE AND PROGRAM CHANGES ARE TRANSMITTED BY E-MAIL
- OTHER INDIRECT CONTACT ADVISING

PROBATION WITH LETTER
CPT/OPT APPLICATIONS

STUDENT ADVISING
- DIRECT CONTACT ADVISING
  - DISQUALIFICATIONS AND REINSTATEMENT PROGRAM OF STUDY
  - UNUSUAL SITUATIONS, BASED ON FILTERING OF REQUESTS BY STAFF, INCLUDING POTENTIAL NEW STUDENT INTERVIEWS

DOCUMENTATION
- ALL COMPLETED INDIRECTLY
- RECLASSIFICATIONS
- CANDIDACY FORMS
- CULMINATING MEMO

PROGRAM PROMOTION
- PRIMARY ADVERTIZING THROUGH WEB SITE (http://www.engr.sjsu.edu/ges/index.php)
  - PROGRAM GENERAL DESCRIPTIONS
  - STUDENT PLANNING SPREADSHEET
  - PRODUCES PROGRAM OF STUDY
  - PRODUCES CANDIDACY FORM
  - COMPLETES GPA CALCULATION

FAQs PAGE
- BASED ON INFORMATION FROM Q & A SESSIONS
- REVISED ABOUT ONCE EACH SEMESTER
- INCLUDES STUDENT CHECK LIST

OTHER WEB COMPONENTS
- ANNOUNCEMENTS
- NEW COURSES
  - SIGNIFICANT PROGRAM REVISIONS

SUMMARY OF PROJECTS/THESIS BY CONCENTRATION
- STUDENT NAMES
- TITLE
- KEYWORDS
- COMMITTEE MEMBERS

STUDENT FORMS
- OTHER PROMOTION ACTIVITIES
  - RECRUIT STUDENTS FROM PROGRAMS THAT REQUIRE GRE
STUDENTS HAVE ACCEPTABLE GPA
STUDENTS ARE AWARE OF SJSU
COE GRADUATE OPEN HOUSE PARTICIPATION
SOME ON-SITE VISITS TO COMPANIES FOR EDUCATIONAL FAIRS
CURRENT ASSESSMENT ACTIVITIES
   ENTRANCE SURVEY
   CLASS SURVEYS
   EXIT SURVEY
   CULMINATING EXPERIENCE IMPRESSIONS
   ENTRANCE SURVEY
      HAS BEEN PREPARED BUT HAS NOT BEEN IMPLEMENTED.
      ASKS STUDENTS ABOUT UNDERGRADUATE PREPARATION
      BASIS OF SELECTION OF SJSU
      PROFESSIONAL BACKGROUND
      WORK LEVEL DURING PROGRAM
      PREFERRED CLASS TIMES
      STUDENT OBJECTIVE FOR DEGREE
      NEED TO FIND A CONVENIENT METHOD TO IMPLEMENT THE
      SURVEY
      IN ENGR 201 OR DURING INITIAL Q & A
   CLASS SURVEYS
      COMMON SURVEYS IN ALL CLASSES, HAVE BEEN IMPLEMENTED
      STUDENT ASSESSMENT OF PROGRAM OUTCOME ATTRIBUTES
      (STATEMENTS)
   CLASS SURVEYS
      COMMENT SECTIONS:
      CLASS SURVEYS
      POSSIBLE RESPONSES BY STUDENTS
   EXIT SURVEYS
      HAVE BEEN DEVELOPED
      HAVE BEEN PARTIALLY IMPLEMENTED
      CURRENT TARGET IS AT THE FINAL DEFENSE
      NEED TO CONSIDER DURING FINAL PROJECT COURSE INSTEAD
      OF COURSE SURVEY
      GENERAL QUESTION CATEGORIES
      ACADEMIC PROGRAM
      CULMINATING EXPERIENCE
      ALUMNI INVOLVEMENT
      STUDENT SERVICES
      BACKGROUND DATA
      GENERAL COMMENTS
   CULMINATING EXPERIENCE IMPRESSIONS
      BASED ON PARTICIPATION BY MSE FACULTY IN FINAL DEFENSES
      CAN INCLUDE INFORMATION FROM DISCUSSIONS WITH INDUSTRIAL AND
      FACULTY COMMITTEE MEMBERS
APPENDIX B – MSE ASSESSMENT RETREAT MINUTES OF MEETING

CAN INCLUDE INFORMATION FROM DISCUSSIONS WITH
PROJECT/THESIS TEAM MEMBERS
TARGET IS COURSE COORDINATION THROUGHOUT PROGRAM

SECTION 2 - SUMMARY OF ASSESSMENT TO DATE
RESULTS OF STUDENT SURVEYS
IMPRESSIONS FROM PROJECTS
RESULTS FROM STUDENT SURVEYS - OUTCOME ATTRIBUTES
RANGE OF 0 (LOWEST) TO 6 (HIGHEST)
OVERALL LEVEL OF AGREEMENT WITH STATEMENTS OF
OUTCOME DESCRIPTIONS
ENTRY LEVEL COURSES – 5.0 = AGREE (4.6 -5.1)
MID-PROGRAM COURSE – 4.9 = AGREE
PROJECT/THESIS COURSES – AGREE (4.9 – 5.3)
AREAS OF RELATIVELY LOW SCORES
4.0 I can apply contemporary tools for computation, simulation, analysis and design.

RESULTS FROM STUDENT SURVEYS – PROGRAM IMPROVEMENTS
THESE ARE BASED ON RESPONSES TO THE PROGRAM QUESTIONS 4 & 5, NOT THE COURSE QUESTIONS 1, 2 & 3.
COURSE QUESTION RESPONSES ARE TO BE USED BY FACULTY TO
REVISE COURSE CONTENT
QUESTION 4 – NEW OR RELATED COURSES TO BE ADDED
FROM COMMON CORE (NEW STUDENTS)
APPLIED STATISTICS
MORE ENGINEERING MANAGEMENT, FROM ISE IF POSSIBLE
QUALITY CONTROL
FINANCE MANAGEMENT
ENGINEERING PRESENTATIONS
INDUSTRY SPEAKERS IN CLASSES

QUESTION 4 – NEW OR RELATED COURSES TO BE ADDED
FROM CONCENTRATION CORE OR ELECTIVE COURSES (MID-DEGREE STUDENTS)
SEMINARS FROM INDUSTRY
TECHNICAL MANAGEMENT
PLANNING AND SUPPLY CHAIN
NEW PRODUCTS INTRODUCTION MANAGEMENT

QUESTION 4 – NEW OR RELATED COURSES TO BE ADDED
FROM PROJECT/THESIS COURSES (FINISHING STUDENTS)
INCREASE NUMBER OF ELECTIVE COURSES
ASSISTANCE IN DEVELOPING PROJECTS
ENGINEERING ECONOMICS
SIMULATIONS AND PROCESS MODELING
APPLIED STATISTICS
MORE BUSINESS COURSES
APPENDIX B – MSE ASSESSMENT RETREAT MINUTES OF MEETING

MORE CONCENTRATION SPECIFIC COURSES

QUESTION 5 – ADDITIONAL COMMENTS FOR IMPROVEMENT
FROM COMMON CORE (NEW STUDENTS)
- REDUCE COMMON CORE TO 2 COURSES
- BETTER COORDINATION BETWEEN 202 AND 203 TO AVOID DUPLICATION
- MORE ADVISING SESSIONS
- INDUSTRIAL SPEAKERS IN CLASSES

QUESTION 5 – ADDITIONAL COMMENTS FOR IMPROVEMENT
FROM CONCENTRATION CORE OR ELECTIVE COURSES (MID-DEGREE STUDENTS)
- START COURSES AFTER 6:00 PM
- BETTER ACCESS TO BUSINESS COURSES
- MORE LABS
- MORE RELEVANT REAL-WORLD COURSES

QUESTION 5 – ADDITIONAL COMMENTS FOR IMPROVEMENT
FROM PROJECT/THESIS COURSES (FINISHING STUDENTS)
- 200W IS AN EXCELLENT COURSE
- INDUSTRIAL TOURS
- REVISE ENGINEERING MANAGEMENT
- MORE FREQUENT COURSE OFFERINGS
- MORE THAN 3 COURSES FROM ONE PROGRAM FOR SPECIAL CONCENTRATION

IMPRESSIONS FROM PROJECTS
- STUDENTS LACK ADEQUATE PREPARATION IN ENGINEERING ECONOMICS
- STUDENTS HAVE LIMITED BACKGROUND IN DOE
- STUDENTS WHO HAVE NOT COMPLETED 200W DO NOT UNDERSTAND CONCEPT OF PLAGIARISM
- PRESENTATIONS ARE VALUABLE COMPONENT OF CLASSES
- SOME CONCERN ABOUT TECHNICAL CONTENT OF ENGINEERING MANAGEMENT PROJECTS

IMPRESSIONS FROM PROJECTS
- COORDINATION WITH INDUSTRIAL SPONSORS CAN BE IMPROVED TO DEVELOP ADDITIONAL PROJECT ACTIVITY
- STUDENTS CAN COMPLETE PROJECTS AS TEAM MEMBERS IN OTHER ENGINEERING PROGRAMS
- WST SEQUENCE IS A DISTRACTION TO COMPLETING THE PROJECTS/THESIS
- 200W IS MAKING A POSITIVE IMPACT ON VERBAL AND WRITTEN PRESENTATIONS

SECTION 3 - DEVELOPMENT OF RECOMMENDATIONS FOR IMPROVEMENT
PROGRAM REVISIONS
COURSE REVISIONS
ASSESSMENT REVISIONS
APPENDIX B – MSE ASSESSMENT RETREAT MINUTES OF MEETING

PROGRAM REVISIONS
POSSIBLE PROMOTIONAL ACTIVITIES REVISIONS
WEB PAGE REVISIONS
BETTER ACCESS, AS MSE IS NOT EXPLICITLY REFERENCED ON COE ENTRY PAGE
STATEMENTS FROM ALUMNI AND INDUSTRY REPRESENTATIVES
LIST OF STUDENT PROJECTS WITH INDUSTRIAL AND ACADEMIC COMMITTEE MEMBERS LISTED
INTERNATIONAL OUTREACH
SURVEY INSTITUTIONS FOR STUDENTS AND SEND PROGRAM ANNOUNCEMENTS
START AN MSE CLUB WITH ONE OR TWO EVENTS EACH YEAR

PROGRAM REVISIONS
STAY WITH THE 3 UNIT PROJECTS
LIMIT THESES TO MOST SIGNIFICANT TYPES OF RESEARCH
INSTALL ENGR 200P AS THE GWAR COURSE
NO WST PREREQUISITE
ORIENTED TOWARDS PROJECT/THESIS COURSES

COURSE REVISIONS
COMMON CORE COURSES
COORDINATION OF COURSES TO AVOID REDUNDANCY
ADDRESS PROJECT COMPONENTS
INDUSTRIAL SPEAKERS
ENGR 200W
CHANGE TO ENGR 200P
INCLUDE PLANNING & SCHEDULING COMPONENT
ENGR 201
MORE APPLIED STATISTICS AND DOE
ENGINEERING ECONOMICS CONCEPTS/MATH AS APPLIED TO PROJECTS

COURSE REVISIONS
ENGR 202
PLANNING AND SUPPLY CHAIN MANAGEMENT OF NEW PRODUCTS
QUALITY CONTROL
ENGR 203
SEMINARS FROM INDUSTRY TECHNICAL MANAGEMENT
PROJECTS/THESIS
FIRST SEMESTER PROJECT INCREASE ECONOMICS COMPONENTS EARLY CHECK TO PREVENT PLAGIARISM
SECOND SEMESTER PROJECT
COURSE REVISIONS
ENGINEERING ECONOMICS CONTENT (LW)
APPENDIX B – MSE ASSESSMENT RETREAT MINUTES OF MEETING

<table>
<thead>
<tr>
<th>Present and future worth</th>
<th>Sensitivity analysis</th>
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<tbody>
<tr>
<td>Annual equivalent cash flow</td>
<td>Uncertainty and risk analysis</td>
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<tr>
<td>Internal rate of return</td>
<td>Alternatives with unequal lives</td>
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<tr>
<td>Minimum acceptable rate of return</td>
<td>Retirement and replacement analysis</td>
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<tr>
<td>Discrete and continuous compounding</td>
<td>Depreciation</td>
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<td>Inflation</td>
<td>Income taxes</td>
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<td>Financing</td>
<td>Break-even analysis</td>
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<tr>
<td>Payback period</td>
<td>Cost/benefit analysis</td>
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<td>Time value of money</td>
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ASSESSMENT REVISIONS

NEED TO USE THE ENTERING STUDENT SURVEY TO ASSESS HOW CURRENT STUDENTS FOUND THE PROGRAM WHICH LOCAL COMPANIES ARE PROMOTING THE PROGRAM DATA COLLECTED AT Q & A SESSIONS
TO: MSE Project/Thesis Industrial Advisor  
FROM: M. B. Jennings, MSE Program Director  
SUBJECT: Assessment of graduating MSE student attributes

Thank you for participating on the committee for the project or thesis completed by SJSU MSE student(s). Your participation is invaluable in terms of providing a significant experience for the student which enhances professional skills.

We have a group of objectives for program graduates that are addressed in various classes and project/thesis activities. In an attempt to include TQM in the program, we are asking you to complete the attached 11 question survey and return it to the project/thesis course coordinator.

Your responses for this survey should be based on your experience with the student during this project/thesis. Not Applicable is an acceptable response if you are lacking adequate evidence to evaluate the topic.

If you can provide us with information about those items that need improvement, we can determine where they can be addressed. Your responses will be used to revise the other courses in the program as well as the format used for the project/thesis activities.

Responses to the survey are anonymous, but please add contact information if you are willing to provide additional detail or if you want to discuss some items in more detail. If you can return this document as an e-mail attachment, that will be most convenient.

If you wish to remain anonymous, please send your form to:
Dr. Michael B. Jennings  
SJSU College of Engineering, MSE Program  
One Washington Square  
San Jose, CA 95192-0205

Again thank you for your participation in the project/thesis activities for our MSE students, including the information you are providing through this survey document.
The following is a survey intended to obtain your impressions as to how well this program is meeting the defined Outcome Objectives, based on your experience with the students during the project/thesis activities.

<table>
<thead>
<tr>
<th>PROJECT OR THESIS FINAL PRESENTATION</th>
<th>SURVEY DATE</th>
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<table>
<thead>
<tr>
<th>MSE PROGRAM OUTCOME STATEMENT</th>
<th>EMPLOYER IMPRESSION</th>
<th>Example from project/thesis activities to support rating.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 Students can work collaboratively with various disciplines of engineering, science and business.</td>
<td>[ ] [ ] [ ] [ ] [ ] [ ] [ ]</td>
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<tr>
<td>2.0 Students can apply advanced theory and analysis for problem solving and synthesize and integrate information in the engineering process.</td>
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<tr>
<td>3.0 Students can effectively communicate for problem analysis and solutions.</td>
<td>[ ] [ ] [ ] [ ] [ ] [ ] [ ]</td>
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<tr>
<td>4.0 Students can apply contemporary tools for computation, simulation, analysis and design.</td>
<td>[ ] [ ] [ ] [ ] [ ] [ ] [ ]</td>
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<tr>
<td>5.0 Students are able to deliver effective presentation of engineering activities in written and oral formats.</td>
<td>[ ] [ ] [ ] [ ] [ ] [ ] [ ]</td>
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<tr>
<td>6.0 Students are aware of the ethical, economic and environmental implication of their engineering activities.</td>
<td>[ ] [ ] [ ] [ ] [ ] [ ] [ ]</td>
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## APPENDIX C - EMPLOYER SURVEY DOCUMENT

### Areas for improvement of the MSE program:

1. **What additional student attributes** would you recommend to be developed in this program, which would better prepare students for professional activities?

2. **What changes** would you recommend as to the structure employed for the project/thesis activity; for example, the responsibilities of participants, the content, the timing, the configurations of the committee and the teams, the value of the industrial component, etc.?

3. **Do you feel this project/thesis activity is of value** to your firm in terms of research output, employee development, technical or economic evaluations, contribution to technical education, etc.?

4. **Based on this experience,** would you be interested in sponsoring future projects/theses, or do you feel the results do not justify your commitment of resources? If you have reservations, please indicate what types of changes we could make that would make it attractive to sponsor additional projects.

5. **Please add any additional comments that would be you feel would be relevant to improvement of the MSE program.**

---

**Voluntary Confirmation Data:**

Name: 

Date: 

Company:

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Thank you for taking the time to provide us with a response.
Thank you for participating in a successful project program this summer. The projects were challenging and the results were impressive. I hope you developed some skills and techniques that will prove useful in the future. If you decide to patent the results of your work and make tons of money, please remember the College of Engineering is always open to donations!

You are also encouraged to consider presenting your results either at conferences or as publications. You will need to do this quickly to avoid losing contact with your colleagues, but your industrial and academic committee members would almost certainly be interested in participating with you in this activity.

As you know, we try to assess the impact of courses on student development and the attached is a copy of that survey. We should have completed it during the final class meetings, but I failed to remember to distribute the forms. So I am now asking you to complete the review and get it back to me.

Please do not return these prior to 01SEP06 as that will assure your grades have been entered into the system and you should not have any concern that grades would be affected by your response.

If you can provide us with information about those items that need improvement, we can determine where they can be addressed. Your responses will be used to revise the other courses in the program as well as the format used for the project/thesis activities.

Responses to the survey are anonymous, but please add contact information if you are willing to provide additional detail or if you want to discuss some items in more detail. If you can return this document as an e-mail attachment, that will be most convenient.

If you wish to remain anonymous, please send your form to:

Dr. Michael B. Jennings
SJSU College of Engineering, MSE Program
One Washington Square
San Jose, CA 95192-0205
The following is a survey intended to determine how well this course is meeting the Outcome Objectives for the MSE Program. Please take a few moments to check your personal impressions and add evidence to support your evaluation. Please note this is not an evaluation of the instructor, but it is an attempt to determine if the content of the course and the method of instruction are supporting the MSE Program Outcome Objectives.

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>SURVEY DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>INSTRUCTOR</td>
<td>M. B. Jennings</td>
</tr>
<tr>
<td>SEMESTER AND YEAR OF COURSE</td>
<td>FALL ☐ SPRING ☐ SUMMER ☒ YEAR 2006 ☒</td>
</tr>
</tbody>
</table>

### MSE PROGRAM OUTCOME STATEMENT

<table>
<thead>
<tr>
<th>MSE PROGRAM OUTCOME STATEMENT</th>
<th>STUDENT IMPRESSION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>STRONGLY AGREE</td>
</tr>
<tr>
<td>1.0 I can work collaboratively with various disciplines of engineering, science and business.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐ ☐</td>
</tr>
<tr>
<td>2.0 I can apply advanced theory and analysis for problem solving and synthesize and integrate information in the engineering process.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐ ☐</td>
</tr>
<tr>
<td>3.0 I can effectively communicate for problem analysis and solutions.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐ ☐</td>
</tr>
<tr>
<td>4.0 I can apply contemporary tools for computation, simulation, analysis and design.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐ ☐</td>
</tr>
<tr>
<td>5.0 I am able to deliver effective presentation of engineering activities in written and oral formats.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐ ☐</td>
</tr>
<tr>
<td>6.0 I am aware of the ethical, economic and environmental implication of my engineering activities.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐ ☐</td>
</tr>
</tbody>
</table>

Example from course activities to support rating.
Areas for improvement of the MSE program:

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 What <strong>additional components</strong> would you recommend adding to this course to better prepare you for professional activities?</td>
<td></td>
</tr>
<tr>
<td>2.0 What changes would you recommend as to the method of instruction that is used in this course? (This can be in terms of general format: lecture, seminar or lab or you can refer to particular methods that in your opinion would make this course more effective.)</td>
<td></td>
</tr>
<tr>
<td>3.0 What changes would you recommend as to how this course is included in the program? (This refers to common core, option core, or elective status and possible prerequisite relationships.)</td>
<td></td>
</tr>
<tr>
<td>4.0 What <strong>new or related courses</strong> would you recommend that be added to the MSE program to meet developing needs.</td>
<td></td>
</tr>
<tr>
<td>5.0 Please add any additional comments that would be relevant to improvement of the MSE program.</td>
<td></td>
</tr>
</tbody>
</table>

Thank you for taking the time to provide us with a response.
## Program Outcomes

<table>
<thead>
<tr>
<th>OUTCOME NUMBER</th>
<th>AVERAGES</th>
<th>DEVIATION</th>
<th>AVERAGE IMPRESSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.33</td>
<td>0.58</td>
<td>AGREE</td>
</tr>
<tr>
<td>2</td>
<td>4.14</td>
<td>1.77</td>
<td>SLIGHTLY AGREE</td>
</tr>
<tr>
<td>3</td>
<td>4.71</td>
<td>1.06</td>
<td>SLIGHTLY AGREE</td>
</tr>
<tr>
<td>4</td>
<td>4.00</td>
<td>1.38</td>
<td>SLIGHTLY AGREE</td>
</tr>
<tr>
<td>5</td>
<td>4.71</td>
<td>1.19</td>
<td>SLIGHTLY AGREE</td>
</tr>
<tr>
<td>6</td>
<td>4.90</td>
<td>0.77</td>
<td>SLIGHTLY AGREE</td>
</tr>
<tr>
<td>OVERALL</td>
<td>4.63</td>
<td></td>
<td>SLIGHTLY AGREE</td>
</tr>
</tbody>
</table>

### Outcome Descriptions

1.0 I can work collaboratively with various disciplines of engineering, science and business.

2.0 I can apply advanced theory and analysis for problem solving and synthesize and integrate information in the engineering process.

3.0 I can effectively communicate for problem analysis and solutions.

4.0 I can apply contemporary tools for computation, simulation, analysis and design.

6.0 I am aware of the ethical, economic and environmental implication of my engineering activities.
<table>
<thead>
<tr>
<th>AREAS FOR IMPROVEMENT</th>
<th>STUDENT COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.0 What additional components would you recommend adding to this course to better prepare you for professional activities?</strong></td>
<td>Discussion with current managers in the industry to relate topics. None. Nothing. Cop-studies: Seeing how real-life projects succeed or fail. More emphasis on CAD/CAM. Design of manufacturability. Design Analysis. Analyze and study of real cases and discuss them in class. None. Provide case study. Add more concentration. More presentations. More oral presentations. How to deal with difficult people. How to read and analyze people to help perform work related functions efficiently and effectively. Give more examples of case study of the topics being discussed. Breaking this course in two semester and giving and more with for practice. More presentations. Actual case studies of effective engineering management.</td>
</tr>
<tr>
<td><strong>2.0 What changes would you recommend as to the method of instruction that is used in this course? (This can be in terms of general format: lecture, seminar or lab or you can refer to particular methods that in your opinion would make this course more effective.)</strong></td>
<td>I would make it seminar format with outside lecturers from industry. I would like to recommend seminar. More seminars. Instructor gave good lectures, but homework and midterm did not reflect his knowledge or experience, both was very generic. Course lectures from the industry professionals. Present real cases on class and analyze the best solution for them. Case study method should be applied to this course. Teach in more conceptual manner rather than memorizing. Add more advisors. Group decisions. More oral presentations. Get rid of the overhead foils. Use power point presentations. Give more interactive lecture and power point presentation not just reading what's on the book. Course projects for some subjects does not help much realistically. I think the use of MS Projects software is an excellent way to demonstrate contemporary AXWP management tool, Gannt charts automatically linked BCWP, etc. to network diagrams, Expected value, etc. but maybe too detailed in this call. I'm not an MSE student. More homework for practicing the concepts. Projects is too big. It should not be more than 20 pages. More of can open discussion seminar.</td>
</tr>
<tr>
<td><strong>3.0 What changes would you recommend as to how this course is included in the program? (This refers to common core, option core, or elective status and possible prerequisite relationships.)</strong></td>
<td>No changes should be done and work well in the program. Option course. Nothing. This course is good as a core course, but may not be very applicable to some course in special concentration such as myself. Relevant to the industry or field. Option course. We can choose whatever class we want to take. No idea. None. I will regret saying</td>
</tr>
</tbody>
</table>
## APPENDIX E – EXAMPLE OF STUDENT CURRICULUM SURVEY RESULTS

<table>
<thead>
<tr>
<th>4.0 What <strong>new or related courses</strong> would you recommend that be added to the MSE program to meet developing needs.</th>
<th>More advanced courses in Management. Technical Courses. Nothing. Personally, I would like to see a laser or Optical component or concentration. Not enough EE courses integrated into MSE. Operation research. Project Management. Option core. None. Course that develop conceptual thinking than theory thinking (memorizing from textbook). Don't know. Courses on Quality and materials and devices that can be applied to every job tasks and to better understand the concepts of unities and when to apply them. Computer Applications. This is an excellent class it needs little more than touching the surface. Finance Management. More seminar classes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0 Please add any additional comments that would be relevant to improvement of the MSE program.</td>
<td>None. Nothing. More advisor, I feel I went through the program with no help or guidance, and was not properly informed on how to prepare for graduation. ISE 230 Operations Research. None. Teach in more conceptual course. More advisors from each department. More labs timing should be given. Don't know. On-the Job training available for all students including foreign students.</td>
</tr>
</tbody>
</table>
### APPENDIX F – RESULTS OF STUDENT EXIT SURVEY

#### Part I: Graduate Engineering Exit Survey

<table>
<thead>
<tr>
<th>Academic Program</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td></td>
</tr>
<tr>
<td>Strongly disagree</td>
<td></td>
</tr>
<tr>
<td>NA*</td>
<td></td>
</tr>
<tr>
<td>No Answer</td>
<td></td>
</tr>
</tbody>
</table>

#### To what extent do you agree/disagree with the following statements about your graduate program:

**Faculty**

1. Faculty members prepare carefully for their graduate classes.  
   - Strongly agree: 37  
   - Agree: 50  
   - Disagree: 7  
   - Strongly disagree: 2  
   - NA*: 3  
   - No Answer: 2

2. The classes I took were well taught.  
   - Strongly agree: 35  
   - Agree: 53  
   - Disagree: 3  
   - Strongly disagree: 3  
   - NA*: 3  
   - No Answer: 2

3. There is good communication between faculty and students regarding student needs, concerns, and suggestions.  
   - Strongly agree: 32  
   - Agree: 47  
   - Disagree: 15  
   - Strongly disagree: 5  
   - NA*: 0  
   - No Answer: 2

4. There are many opportunities outside the classroom for interaction between students and faculty.  
   - Strongly agree: 28  
   - Agree: 50  
   - Disagree: 17  
   - Strongly disagree: 3  
   - NA*: 0  
   - No Answer: 2

5. Faculty were interested in the welfare and professional development of graduate students.  
   - Strongly agree: 35  
   - Agree: 47  
   - Disagree: 10  
   - Strongly disagree: 3  
   - NA*: 3  
   - No Answer: 2

6. Faculty members were well qualified to teach their courses.  
   - Strongly agree: 47  
   - Agree: 35  
   - Disagree: 10  
   - Strongly disagree: 3  
   - NA*: 5  
   - No Answer: 0

7. My advisor and I met at appropriate intervals to discuss my program of study.  
   - Strongly agree: 35  
   - Agree: 47  
   - Disagree: 12  
   - Strongly disagree: 5  
   - NA*: 0  
   - No Answer: 2

**Students**

8. The intellectual caliber of students in the program is high.  
   - Strongly agree: 22  
   - Agree: 55  
   - Disagree: 20  
   - Strongly disagree: 0  
   - NA*: 2  
   - No Answer: 2

9. I feel that I am part of a graduate university learning community.  
   - Strongly agree: 40  
   - Agree: 43  
   - Disagree: 15  
   - Strongly disagree: 2  
   - NA*: 0  
   - No Answer: 0

**Academic Program**

10. My program was intellectually challenging and stimulating.  
    - Strongly agree: 50  
    - Agree: 42  
    - Disagree: 7  
    - Strongly disagree: 2  
    - NA*: 0  
    - No Answer: 0

11. I would recommend my graduate program to prospective students.  
    - Strongly agree: 50  
    - Agree: 40  
    - Disagree: 8  
    - Strongly disagree: 2  
    - NA*: 0  
    - No Answer: 0

12. If I were starting over, I would enroll in this program again.  
    - Strongly agree: 27  
    - Agree: 52  
    - Disagree: 20  
    - Strongly disagree: 2  
    - NA*: 0  
    - No Answer: 0

13. I believe that my program provided me with a good preparation for my future career.  
    - Strongly agree: 45  
    - Agree: 42  
    - Disagree: 13  
    - Strongly disagree: 0  
    - NA*: 0  
    - No Answer: 0

14. Courses listed in the catalog are offered frequently enough for timely completion of the degree requirements.  
    - Strongly agree: 32  
    - Agree: 35  
    - Disagree: 28  
    - Strongly disagree: 5  
    - NA*: 0  
    - No Answer: 0

15. I found an industry internship or permanent job through the faculty recommendation.  
    - Strongly agree: 10  
    - Agree: 15  
    - Disagree: 35  
    - Strongly disagree: 12  
    - NA*: 27  
    - No Answer: 2
### APPENDIX F – RESULTS OF STUDENT EXIT SURVEY

**Master's Project/Thesis Experience**

<table>
<thead>
<tr>
<th>To what extent are the following statements applicable to your principal thesis/project advisor?</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly agree</td>
</tr>
<tr>
<td>16. Spent the time necessary to advise me on academic matters</td>
<td>48</td>
</tr>
<tr>
<td>17. Discussed my research with me on a regular basis</td>
<td>43</td>
</tr>
<tr>
<td>18. Was accessible</td>
<td>45</td>
</tr>
<tr>
<td>19. Was interested in my goals and projects</td>
<td>47</td>
</tr>
<tr>
<td>20. Critiqued my work in ways that helped my work progress</td>
<td>55</td>
</tr>
<tr>
<td>21. Returned my work in a timely manner</td>
<td>48</td>
</tr>
<tr>
<td>22. My communication and research skills learned at SJSU assisted in the successful completion of my master's project/thesis.</td>
<td>42</td>
</tr>
<tr>
<td>23. I felt prepared to complete a professional quality project/thesis</td>
<td>45</td>
</tr>
<tr>
<td>24. My project directly led to a permanent position or post-grad, and internship.</td>
<td>22</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please select all that apply.</td>
</tr>
<tr>
<td>25. As a COE alumnus, which of the following would be a draw to bring you back in person to campus?</td>
</tr>
<tr>
<td>26. As a COE alumnus, which of the following would be a draw to bring you back in person to campus?</td>
</tr>
</tbody>
</table>
### APPENDIX F – RESULTS OF STUDENT EXIT SURVEY

#### Part II: Student Services Survey

<table>
<thead>
<tr>
<th>How satisfied are you with the following in the College of Engineering?</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very satisfied</td>
<td>Satisfied</td>
</tr>
<tr>
<td>27. Academic advising</td>
<td>28</td>
</tr>
<tr>
<td>28. Mentoring (e.g., guidance in gaining professional competencies and status)</td>
<td>27</td>
</tr>
<tr>
<td>29. Adequacy of departmental resources and support (e.g., work space, assistantships, access to computers)</td>
<td>30</td>
</tr>
<tr>
<td>30. Communication about academic policies and procedures</td>
<td>28</td>
</tr>
<tr>
<td>31. Contacting the College of Engineering</td>
<td>30</td>
</tr>
<tr>
<td>32. Usefulness of quality and quantity of information about COE</td>
<td>33</td>
</tr>
<tr>
<td>33. Applying to SJSU</td>
<td>45</td>
</tr>
<tr>
<td>34. Timeliness of feedback from the department</td>
<td>33</td>
</tr>
<tr>
<td>35. Helpfulness of International Students Services</td>
<td>28</td>
</tr>
<tr>
<td>36. Student orientation was informative and important.</td>
<td>37</td>
</tr>
<tr>
<td>37. Overall, I am satisfied with my experience in the College of Engineering.</td>
<td>45</td>
</tr>
</tbody>
</table>

Please respond regarding to your discovering SJSU College of Engineering.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>No Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>38. Discovered San Jose State University (SJSU)/College of Engineering through</td>
<td>18</td>
<td>58</td>
<td>0</td>
<td>17</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Internet</th>
<th>B. Friends</th>
<th>C. Open House</th>
<th>D. Was undergraduate here</th>
<th>E. Employer</th>
<th>No Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>58</td>
<td>0</td>
<td>17</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>
Part III: Background Information

<table>
<thead>
<tr>
<th>Question</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Yes, same major</td>
<td></td>
</tr>
<tr>
<td>B. Yes, but different major</td>
<td></td>
</tr>
<tr>
<td>C. No</td>
<td></td>
</tr>
<tr>
<td>39. Is your previous degree from SJSU?</td>
<td>A: 3</td>
</tr>
<tr>
<td>B: 83</td>
<td>C: 2</td>
</tr>
<tr>
<td>D: 0</td>
<td>E: 3</td>
</tr>
<tr>
<td>40. If the answer is yes, when did you receive your BS degree?</td>
<td>A: 3</td>
</tr>
<tr>
<td>B: 83</td>
<td>C: 2</td>
</tr>
<tr>
<td>D: 0</td>
<td>E: 3</td>
</tr>
<tr>
<td>41. How many units on the average did you take per semester?</td>
<td>A: 15</td>
</tr>
<tr>
<td>B: 43</td>
<td>C: 27</td>
</tr>
<tr>
<td>D: 3</td>
<td>E: 10</td>
</tr>
<tr>
<td>42. How long have you taken to finish your MS degree?</td>
<td>A: 33</td>
</tr>
<tr>
<td>B: 10</td>
<td>C: 5</td>
</tr>
<tr>
<td>D: 10</td>
<td>E: 42</td>
</tr>
<tr>
<td>43. What was your employment status for most of your graduate studies?</td>
<td>A: 13</td>
</tr>
<tr>
<td>B: 73</td>
<td>C: 3</td>
</tr>
<tr>
<td>D: 5</td>
<td>E: 5</td>
</tr>
<tr>
<td>44. How did you qualify for the writing requirement?</td>
<td>A: 13</td>
</tr>
<tr>
<td>B: 73</td>
<td>C: 3</td>
</tr>
<tr>
<td>D: 5</td>
<td>E: 5</td>
</tr>
<tr>
<td>45. MS Major:</td>
<td></td>
</tr>
<tr>
<td>A. Aerospace Engineering</td>
<td></td>
</tr>
<tr>
<td>B. Chemical Engineering</td>
<td></td>
</tr>
<tr>
<td>C. Civil and Environmental Engineering</td>
<td></td>
</tr>
<tr>
<td>D. Computer Engineering</td>
<td></td>
</tr>
<tr>
<td>E. Electrical Engineering</td>
<td></td>
</tr>
<tr>
<td>46. MS Major:</td>
<td></td>
</tr>
<tr>
<td>A. Human Factors</td>
<td></td>
</tr>
<tr>
<td>B. Industrial and Systems Engineering</td>
<td></td>
</tr>
<tr>
<td>C. Materials Engineering</td>
<td></td>
</tr>
<tr>
<td>D. Mechanical Engineering</td>
<td></td>
</tr>
<tr>
<td>47. MS Major:</td>
<td></td>
</tr>
<tr>
<td>A. Quality Assurance-Technology</td>
<td></td>
</tr>
<tr>
<td>B. Software Engineering</td>
<td></td>
</tr>
<tr>
<td>C. Others, please specify</td>
<td></td>
</tr>
<tr>
<td>48. MSE Options:</td>
<td></td>
</tr>
<tr>
<td>A. Electronic Materials and Devices</td>
<td></td>
</tr>
<tr>
<td>B. Engineering Management</td>
<td></td>
</tr>
<tr>
<td>C. Environmental Systems</td>
<td></td>
</tr>
<tr>
<td>D. Manufacturing Systems</td>
<td></td>
</tr>
<tr>
<td>E. Microelectronics Packaging</td>
<td></td>
</tr>
<tr>
<td>49. MSE Option</td>
<td></td>
</tr>
<tr>
<td>A. Special Option</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<td>C: 3</td>
</tr>
<tr>
<td>D: 5</td>
<td>E: 5</td>
</tr>
<tr>
<td>44. How did you qualify for the writing requirement?</td>
<td>A: 13</td>
</tr>
<tr>
<td>B: 73</td>
<td>C: 3</td>
</tr>
<tr>
<td>D: 5</td>
<td>E: 5</td>
</tr>
<tr>
<td>45. MS Major:</td>
<td></td>
</tr>
<tr>
<td>A. Aerospace Engineering</td>
<td></td>
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<tr>
<td>B. Chemical Engineering</td>
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<tr>
<td>C. Civil and Environmental Engineering</td>
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<tr>
<td>D. Computer Engineering</td>
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<tr>
<td>E. Electrical Engineering</td>
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<tr>
<td>46. MS Major:</td>
<td></td>
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<tr>
<td>A. Human Factors</td>
<td></td>
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<tr>
<td>B. Industrial and Systems Engineering</td>
<td></td>
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<tr>
<td>C. Materials Engineering</td>
<td></td>
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<tr>
<td>D. Mechanical Engineering</td>
<td></td>
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<tr>
<td>47. MS Major:</td>
<td></td>
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<tr>
<td>A. Quality Assurance-Technology</td>
<td></td>
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<tr>
<td>B. Software Engineering</td>
<td></td>
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<tr>
<td>C. Others, please specify</td>
<td></td>
</tr>
<tr>
<td>48. MSE Options:</td>
<td></td>
</tr>
<tr>
<td>A. Electronic Materials and Devices</td>
<td></td>
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<tr>
<td>B. Engineering Management</td>
<td></td>
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<tr>
<td>C. Environmental Systems</td>
<td></td>
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<tr>
<td>D. Manufacturing Systems</td>
<td></td>
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<tr>
<td>E. Microelectronics Packaging</td>
<td></td>
</tr>
<tr>
<td>49. MSE Option</td>
<td></td>
</tr>
<tr>
<td>A. Special Option</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX F – RESULTS OF STUDENT EXIT SURVEY

Graduate Engineering Student Survey – Spring 2005
Students’ COE experiences – Verbatim Comments
General Engineering

A. Academic environment

Academic environment is competitive and healthy. Students are expected to spend a lot of time in the library to research the material.

The overall experience of studying at SJSU is satisfactory. I met good friends and faculty.

I think the academic environment at SJSU is a very good environment especially at the COE. It allows you take different courses in different departments, which increases your knowledge in a way or another.

It was a good experience to study in the MSE department. Subjects can be made a little more interesting.

Great environment for study

I am really very happy and satisfied about the academic environment, curriculum, resources, etc. It was a wonderful experience to be part of the SJSU.

From the personal point of view, I found SJSU a very interesting place. I had a chance to be familiar with people from east of Asia and South America.

Overall, it has been a wonderful experience being in the college and learning.

Convenient for people who work

Academic environment at SJSU is very good.

MSE academic environment encouraged learning.

The academic environment needs to be improved because as a student I find it difficult to contact a faculty when I have questions. The faculty in general is busy with other things and when they come to class, I felt like I did not get much of the lectures. The curriculum is not quite relevant to the major. There should be more quality classes to support the major.

The academic environment is very good and fosters a lot of competition among students.

Academic environment is good.

Good academic environment, resources, faculty
APPENDIX F – RESULTS OF STUDENT EXIT SURVEY

Academic environment is good

Academic environment is good, competitive, challenging and enthusiastic.

There were not enough faculty, not enough resources, and students were not well informed about academic policy/requirements.

**Very difficult experience following the program: lack of courses, lack of advising**

In the years of my COE, I think that the academic environment is good enough for each student who would like to be well educated in technologies. Most of the instructors are very qualified to teach. Overall, I am satisfied with my experience in COE.

**B. Curriculum**

Very difficult to get into classes

Classes are hard to get.

Need to add more classes especially in Electrical Engineering

Mate 260 is a required class for MSE students majoring in Electronic Material & Devices. Could it be an elective course instead of a course we must take in order to graduate?

Need more choices of classes

I understand that the university has mostly working students in the MS department. In addition, the emphasis on finding a career is very important here. However, I would like to see SJSU offer PhD programs in the future. I think it will boost the reputation of the school and the academic environment would improve as well.

From an academic point of view, I think there are more to do. I had two classes that I enjoyed a lot ENGR 242 Signal Integrity and Engr 202 System Engineering. I expected to receive better education in management. Students need to engage in real projects and it is the responsibility of instructors to find a project from industry and let his/her students finish it. This strategy brings more facilities to school and helps students find a better job.

It was a good program. I was able to choose my classes and customize it to my needs.

I think some of the Robotics classes should be offered more than one every few semesters.

Curriculum is very good.
Classes tend to be exam oriented. In many cases, that should be modified

Curriculum – good

Curriculum should be changed to meet the industry standards – more labs, project

Program was very flexible.

C. Resources

The labs at COE are well equipped and give opportunity for students to master their skills.

Resources need more attention in terms of lab equipment.

Great resources

Resources are very good. Students have facilities like computer labs, cafeterias, etc.

Resources available are excellent.

Resources have to be updated. In general, studying in SJSU was a good experience.

Resources- good

Resources should be increased as the number of students has increased

Resources were plenty and easily accessible.

D. Faculty-student communication

Good communication

Excellent communication between faculty and students. Students’ doubts about their courses were cleared right away.

More ways of contacting faculty must be available.

Faculty-student communication was a good experience.

Faculty-student communication - good

WST mentoring really helped to pass the exam.
APPENDIX F – RESULTS OF STUDENT EXIT SURVEY

I recommend that there should be communication between faculty of COE and students.

I liked the faculty-student communication. All the professors were friendly and understanding.

E. Quality of advising/mentoring

Dr. XXX took great interest in my career goals and directed me towards the right courses.

Dr. XXX helped me to network with industry leaders for my start-up business plan.

Dr. XXX of C.O.B helped with my business communication. She gave me personal attention.

Good advising

It is very hard to get advising. Not too much time available for the advisors.

Student advising is very good.

I was required to coordinate with my advisor for my program of study and I received excellent support and guidance from him. Would appreciate more streamlined processes in the administrative areas, as there is confusion about certain things in the students’ minds.

The quality of advising is not great. I understand it must be due to the many students who came to Dr. XXX. I think COE should have more academic advisors. Personally, I like Dr. XXX. But it is so difficult to get an appointment with him. I understand that he has many tasks in his plate. COE needs to improve the lack of advisor’s time.

Quality of advising and instruction is good.

Quality of advising – better if there are more one-on-one sessions

Faculty is good and especially the program advisor. Professor XXX is very helpful. I really feel that all the instructors and advisors took interest in advising and helped to accomplish the path of progress for students.

I still have a hard time communicating with the MSE Office. I have come down to MSE office several times to check my status. However, every time I was getting no response. I was not pleased with the service MSE provided. I think students would be more concerned about getting response in timely manner especially for some urgent issues.

F. Staff
APPENDIX F – RESULTS OF STUDENT EXIT SURVEY

Never had any problem with the staff

Staff - good

The staff at front desk should be careful in resolving student issues.

G. Faculty, general

Faculty members met so far are great. They have been a great support.

Faculty members are well experienced and have taken personal interest in my career. All the members are accessible and have been very helpful in advising about academics.

Overall, my experience with the COE is very satisfying. I would recommend that there are more career fairs for COE alumnus.

Majority is good faculty

The faculty was all well qualified and they taught as well.

I believe SJSU has a great staff of professors. Most of them have industry experience working for important companies in the Silicon Valley.

SJSU has good faculty members

The faculty in general was always attentive to answering questions. I always felt faculty was open and available to satisfy my curiosity or need for learning.

Faculty in general has been very knowledgeable and approachable.

Faculty is experienced and helped students a lot.

Faculty - good

H. Quality of instruction

Dr. XXX, Dr. XXX (Tech Planning and Mgt) and Dr XXX (Leadership) were truly, truly brilliant in what they taught. My experiences with Dr. XXX were excellent as well. He was definitely inspirational as well. On the other side, supply chain engineering class (Prof XXX) was just not up the work. Too boring and it was a subject I was interested in so it was a very disappointing experience. Dr. XXX’s unconventional teaching methods were not that agreeable to me, but they helped me prepare better for situations very common in the business world.
APPENDIX F – RESULTS OF STUDENT EXIT SURVEY

Great instructors, they are always approachable.

Good quality

Quality of instruction is good.

Quality of instruction is very good.

Quality of instruction is good.

Quality of instruction - good

Quality of instruction was good.

I. Students

Diverse and good for networking

Students – good

Networking was good.
SURVEY DOCUMENT

Graduate Student Entrance Survey

Student Name___________________________________
Date_____________

Specialization objective: (circle one)               (List specializations here)

1. What was your undergraduate degree? (circle one)
   a. Computer Engineering
   b. Mechanical Engineering
   c. Electrical/Electronics Engineering
   d. Civil Engineering
   e. Management of information systems
   f. Chemical Engineering
   g. Physics/Mathematics
   h. Others (please name it)

2. From which university did you obtain your BS Degree? (circle one)
   a. SJSU
   b. UC Berkely
   c. Other UC (which?)
   d. Other CSU (which)
   e. Other (please name it)

3. How did you learn about the MS Program? (select all that apply)
   a. Internet
   b. Family, friend or colleague who is currently a student at SJSU
   c. Family, friend or colleague who is an SJSU graduate
   d. Faculty member orientation or recruiting (directly or indirectly)
   e. Letter from the Department
   f. Other (please describe)

4. Why did you choose SJSU for your graduate work? (select all that apply)
   a. Location
   b. Reputation
   c. Specific concentration/research area
   d. Personal interaction with a faculty or staff
   e. Availability of evening classes
5. Did you apply to other Universities? (circle one)
   a. Yes. If yes, please list them:
   ______________________________________________________
   b. No

6. How many years since receiving your BS have you been working in industry?
   a. 0 years
   b. 1-2 years
   c. 3-4 years
   d. 5 or more years
   e. 10 or more years

7. What type of industry are you employed in, and what is your title (if applicable)?

8. While you are in the MS program, do you expect to work in industry? (circle one)
   a. Full-time
   b. Part-time (how many hours per week?)
   ________________________________________
   c. Not at all, I expect to be a full time student

9. With respect to tuition, are you?
   a. In-state (California)
   b. Out-of state (which state are you from?)
   c. International (which nation are you from?)

10. What class start times are best for you? (circle the two most convenient times)
    a. Early mornings around 7AM
    b. Day 9 AM to 3 PM
    c. Late afternoons around 4 PM
    d. Evenings starting at 6 PM
    e. Evenings starting at 7 PM
    f. Saturday mornings

11. What is your purpose in pursuing a Masters Degree?

12. Upon completion of your Masters Degree, what type of job you expect to have?

13. Please tell us anything else you would like us to know about you and/or your expectations of the graduate program.
14. List any particular laboratory skills and capabilities (instrument, mechanical, computer, etc.) you might have?

15. What features would you like to see in the graduate program to make it more attractive to you?

16. What benefit do you expect to achieve, for instance, career improvement, job in a different industry, etc. in pursuing a Masters Degree?

17. Does your company have any job openings for (Put major here) Engineers, and if so, what company?
RESULTS FROM SURVEY

1. What type of industry are you employed in, and what is your title?

Printed circuit board fabricator – assistant research engineer
ULSI (ASIC) – ASIC design engineer
Semiconductor – ASIC design engineer
IT- engineer, project manager
Electronics company

2. What is your purpose in pursuing a Masters Degree?

Acquire knowledge in interested area
Get theoretical knowledge and to keep up with the latest technology
Get a good job in a good company
Interest
Find job in the semiconductor industry
To be part of the industry in the Silicon Valley
Advance career
Learn more about engineering management and advance knowledge about electronic Materials
Higher education

3. Upon completion of your Masters Degree, what type of job do you expect to have?

Same job – ASIC design engineer
Electronic based, hardware company
Same with extended responsibilities
DSP software engineer
Analyst
Research engineer in the semiconductor industry
Project/technical manager
Product management
R&D engineering position
Engineering management
Information technology areas

4. Please tell us anything else you would like us to know about you and/or your expectations of the graduate program?

Restriction in taking courses in EE and CMPE department should be removed.
Clashing of the course timings restricts us to take more classes.
Program to be offered in a more flexible manner. Fulfill all concentrations
Degree without thesis
More classes focusing on engineering management
Listen students’ advise more