An Implementation of Continuous Improvement of The Engineering Management Program at California State University, Northridge

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An Implementation of Continuous Improvement of The Engineering Management Program at University X

University X has a newly introduced undergraduate program in Engineering Management (EM) which will be going up for ABET accreditation in Fall 2015. In this paper, the authors have discussed the efforts that are being carried out as part of the continuous improvement initiative required for ABET accreditation.

As part of this work, the authors have researched undergraduate EM programs across the country and then have identified patterns which can be used as one of the guiding factors to decide on potential course offerings that the program at university X could have. These will be used for benchmarking purposes and will help carry out future research in order to continue working on program improvements. This paper is thus, a first step in a series of initiatives that will be carried out at university X as part of our continuous improvement efforts for the newly introduced undergraduate EM program.

The results of this first step in continuous improvement will be presented in this paper and the later steps will continue to be published as a series of papers in both local as well as future annual ASEE conferences.

Introduction

More than two-thirds of all engineering professionals invest a significant portion of their career in managing and administering a wide range of technical engineering and research projects and budgets (CSUN 2012). As the engineering profession evolves, an increasing need has emerged for entry-level engineering professionals who have both a broad engineering background and the knowledge and ability to interface between the business and technical functions of organizations. It was to meet this demand that university X, introduced an EM program at the undergraduate level effective Fall 2009.

Undergraduate engineering management majors learn engineering fundamentals, together with the art and science of planning, organizing, allocating resources, and directing and controlling activities in technological environments. The Bachelor of Science in Engineering Management equips entry-level engineers with knowledge of the business of engineering, making them valuable to their employers and ensuring future professional growth. For students who enjoy people and technology, the technical challenges of engineering, and the opportunity to integrate higher-level organizational considerations into technological decision-making processes, engineering management is an ideal program of study (CSUN 2014), (Becker, 2007).

The undergraduate engineering management degree program includes studies in basic mathematics and sciences, the engineering sciences, engineering management disciplinary
studies, and technical electives, as well as general education. The selection of technical electives can be tailored to particular areas of student interest. The team project experiences in many courses approximate the professional environment that graduates will encounter in their future careers. Program culminating experiences include community service learning course projects and capstone course design projects. Students have access to the well-equipped laboratories, including computing laboratories with discipline-specific software that are essential to achievement of program objectives. (CSUN, 2014)

This was further emphasized by Sorto (2008) when he stated that increasing competition in the marketplace as well as the need for improved productivity had put more of an emphasis on a more effective management of technical functions of a company. Moreover, in search of better flexibility and efficiency, many companies have reduced the numbers and levels of management positions and instead are giving more decision making power to the teams at the operational levels. In high tech companies, this often results in engineers taking more decisions; thus increasing the demand for engineering management courses so as to enable engineers to take better decisions to bring increased value to their organizations.

One of the reasons that the authors of this paper were inspired to do this research as part of their continuous improvement efforts is that despite EM having established itself as a strong discipline with educational degrees, academic journals and professional societies, there is still no firm agreement relatively to the body of knowledge required to establish an engineering management curriculum. A large amount of variation exists among the various EM curriculums (Sorto, 2008). Furthermore, some engineering management curricula are not designed to help students to learn how to make effective decisions and deal with problem solving in highly ambiguous and uncertain contexts (Sorto, 2008). This will also be taken into consideration by the authors when considering changes to the undergraduate EM program at University X.

The undergraduate EM programs that the authors researched were picked from the American Society of Engineering Management (ASEM) website listing of EM programs at the undergraduate level (ASEM, 2013). The schools selected in the first iteration of the online research were:

1. Augustana College
2. Bucknell University
3. Clarkson University
4. The College of New Jersey
5. Columbia University
6. George Washington University
7. Stanford University
8. Miami University
9. Missouri Tech
10. Missouri University of Science & Technology  
11. Northwestern University  
12. Rensselaer Polytechnic  
13. Saint Mary’s University  
14. Stevens Institute of Technology  
15. University of Portland  
16. University of Vermont  
17. University of South Carolina Upstate  
18. University of Alabama  
19. University of Arizona  
20. University of The Pacific  
21. United States Military Academy  
22. Western Michigan University  
23. Wilkes University  
24. York College

On doing a further in-depth study of the EM programs at the 24 schools listed above, the authors realized that despite some of the programs being listed on ASEM’s website (as of Dec 2013) as Engineering Management Programs, they were closer to Industrial Engineering.

Despite there being similarities between IE and EM programs to a certain extent, there are differences between the two, which are highlighted in Table 1. The curriculum summary for the two programs has been adopted from Elrod et al (2007) and is modified as shown in Table 1.

<table>
<thead>
<tr>
<th>B.S. in Engineering Management</th>
<th>B.S. in Industrial Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economics</td>
<td>Economics</td>
</tr>
<tr>
<td>Probability &amp; Statistics</td>
<td>Probability &amp; Statistics</td>
</tr>
<tr>
<td>Senior Design</td>
<td>Senior Design</td>
</tr>
<tr>
<td>Total Quality Management</td>
<td>Statistical Process Control</td>
</tr>
<tr>
<td>Operations &amp; Production Management</td>
<td>Production Planning &amp; Inventory Control</td>
</tr>
<tr>
<td>Marketing</td>
<td>Systems Analysis</td>
</tr>
<tr>
<td>Accounting</td>
<td>Operations Research</td>
</tr>
<tr>
<td>Project Management</td>
<td>Automation, Simulation &amp; Modelling</td>
</tr>
<tr>
<td>General Management &amp; Leadership</td>
<td>Ergonomics, Human Factors, Work Design</td>
</tr>
<tr>
<td></td>
<td>Facilities Design and Plant Layout</td>
</tr>
</tbody>
</table>

Table 1: Curriculum summary (Adopted from Elrod et al (2007))

However, upon seeing the overlap in curriculum and importance of an engineering manager understanding systems engineering, the authors have considered the EM programs, including those with a focus on systems engineering. Due to this, several of the schools studied by the authors, including Stevens Institute of Technology, University of Arizona and Missouri University of Science and Technology, have programs in engineering management and systems engineering.
Considering the above mentioned factors, during the 2nd iteration of finalizing the schools to come up with a benchmark for our undergraduate program, the authors narrowed down the schools to the following, listed in Table 2

<table>
<thead>
<tr>
<th>Names of Schools Considered for 2nd Iteration of Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarkson University</td>
</tr>
<tr>
<td>George Washington University</td>
</tr>
<tr>
<td>Missouri University of science and technology</td>
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<tr>
<td>Missouri Tech</td>
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<tr>
<td>Rensselaer Polytechnic</td>
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<tr>
<td>Saint Mary's University</td>
</tr>
<tr>
<td>Stevens Institute of Technology</td>
</tr>
<tr>
<td>University of Arizona</td>
</tr>
<tr>
<td>University of Pacific</td>
</tr>
<tr>
<td>United States Military Academy</td>
</tr>
<tr>
<td>Western Michigan University</td>
</tr>
<tr>
<td>York College of Pennsylvania</td>
</tr>
</tbody>
</table>

Table 2: List of Undergraduate EM Programs Evaluated for Continuous Improvement of the program at University X

Table 3 names the program and shows the list of the relevant courses for each school chosen

<table>
<thead>
<tr>
<th>University</th>
<th>Program</th>
<th>Courses</th>
</tr>
</thead>
</table>
| Engineering Management | ENG MGT 101 Special Topics  
ENG MGT 124 Practical Concepts for Technical Managers  
ENG MGT 134 Managing Engineering And Technology  
ENG MGT 137 Economic Analysis of Engineering Projects  
ENG MGT 147 Engineering Accounting and Finance  
ENG MGT 201 Special Topics  
ENG MGT 202 Cooperative Engineering Training  
ENG MGT 213 Introduction to Complex System Management  
ENG MGT 224 Competition Team Design  
ENG MGT 233 Competition Team Leadership  
ENG MGT 242 Competition Team Communication  
ENG MGT 251 Marketing Management  
ENG MGT 253 Operations And Production Management  
ENG MGT 254 Introduction to Project Management  
ENG MGT 257 Materials Handling And Plant Layout  
ENG MGT 260 General Management-Design And Integration  
ENG MGT 266 Quality  
ENG MGT 299 Engineering Management Senior Design  
ENG MGT 300 Special Problems  
ENG MGT 301 Special Topics  
ENG MGT 308 Economic Decision Analysis  
ENG MGT 309 Six Sigma  
ENG MGT 311 Human Factors  
ENG MGT 313 Managerial Decision Making  
ENG MGT 314 Management for Engineers and Scientists  
ENG MGT 320 Technical Entrepreneurship  
ENG MGT 327 Legal Environment  
ENG MGT 344 Interdisciplinary Problems in Manufacturing Automation  
ENG MGT 345 Energy and Sustainability Management Engineering  
ENG MGT 350 Risk Assessment and Reduction  
ENG MGT 351 Industrial Marketing Systems Analysis  
ENG MGT 354 Integrated Product And Process Design  
ENG MGT 356 Industrial System Simulation  
ENG MGT 357 Advanced Facilities Planning & Design  
ENG MGT 358 Integrated Product Development  
ENG MGT 361 Project Management  
ENG MGT 364 Value Analysis  
ENG MGT 365 Operations Management Science  
ENG MGT 366 Supply Chain Management Systems  
ENG MGT 369 Patent Law  
ENG MGT 370 Teaching Engineering  
ENG MGT 372 Production Planning And Scheduling  
ENG MGT 373 Intelligent Investing  
ENG MGT 374 Engineering Design Optimization  
ENG MGT 375 Total Quality Management  
ENG MGT 376 Introduction To Quality Engineering  
ENG MGT 377 Introduction To Intelligent Systems  
ENG MGT 381 Management And Methods In Reliability  
ENG MGT 382 Introduction To Operations Research  
ENG MGT 383 Packaging Management  
ENG MGT 385 Statistical Process Control  
ENG MGT 386 Safety Engineering Management  
ENG MGT 390 Undergraduate Research |
<table>
<thead>
<tr>
<th>University</th>
<th>Course List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missouri Tech</td>
<td>Accounting, Marketing I, Management Styles, Marketing II, Project Management, Human Resource Management</td>
</tr>
<tr>
<td>Institution</td>
<td>Courses</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Stevens Institute of Technology</td>
<td>Management of Engineering and Technology</td>
</tr>
<tr>
<td></td>
<td>Project Management</td>
</tr>
<tr>
<td></td>
<td>Accounting &amp; Business Analysis</td>
</tr>
<tr>
<td></td>
<td>Engineering Design VI</td>
</tr>
<tr>
<td></td>
<td>Modeling and Simulation</td>
</tr>
<tr>
<td></td>
<td>Production and Operations Management</td>
</tr>
<tr>
<td></td>
<td>Analysis of Networks and Strategies</td>
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<tr>
<td></td>
<td>Engineering Economics</td>
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<tr>
<td></td>
<td>Elements of Operations Research</td>
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<td></td>
<td>Total Quality Management</td>
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<td></td>
<td>Statistics For Engineers Laboratory</td>
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<td>Statistics for Engineering Managers</td>
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<td>Innovative System Design</td>
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<td>Engineering Design VII</td>
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<td></td>
<td>Engineering Design VIII</td>
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<tr>
<td></td>
<td>Business Process Reengineering</td>
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<td></td>
<td>Logistics and Supply Chain Management</td>
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<tr>
<td></td>
<td>Analysis of Networks &amp; Strategies</td>
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<tr>
<td></td>
<td>Total Quality Management</td>
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<tr>
<td>University of Arizona</td>
<td>SIE 265 Engineering Management I</td>
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<tr>
<td></td>
<td>SIE 2955 Systems &amp; Industrial Engineering Sophomore Colloquium</td>
</tr>
<tr>
<td></td>
<td>SIE 270 Mathematical Foundations of Systems and Industrial Engineering</td>
</tr>
<tr>
<td></td>
<td>SIE 305 Introduction to Engineering Probability and Statistics</td>
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<tr>
<td></td>
<td>SIE 340 Deterministic Operations Research</td>
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<tr>
<td></td>
<td>SIE 367 Engineering Management II</td>
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<tr>
<td></td>
<td>SIE 457 Project Management</td>
</tr>
<tr>
<td></td>
<td>SIE 431 Simulation Modeling and Analysis</td>
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<tr>
<td></td>
<td>SIE 415 Technical Sales and Marketing</td>
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<td></td>
<td>SIE 462 Production Systems Analysis</td>
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<tr>
<td></td>
<td>ENGR 498A or SIE 498B Senior Design Projects I</td>
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<tr>
<td></td>
<td>ENGR 498B or SIE 498B Senior Design Projects II</td>
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<tr>
<td></td>
<td>SIE 414 Law for Engineers and Scientists</td>
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<td></td>
<td>SIE 406 Quality Engineering</td>
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<td>SIE 464 Cost Estimation</td>
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<tr>
<td>University of Pacific</td>
<td>EMT 155. Computer Simulation</td>
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<td>EMT 170. Engineering Administration</td>
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<td>EMT 172. Engineering Economy</td>
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<td>EMT 174. Engineering Project Management</td>
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<td>EMT 176. Systems Engineering Management</td>
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<td>EMT 191. Independent Study</td>
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<td></td>
<td>EMT 195. Engineering Management Synthesis</td>
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<td>EMT 197. Undergraduate Research</td>
</tr>
<tr>
<td>United States Military Academy</td>
<td>EM381. ENGINEERING ECONOMY</td>
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<td></td>
<td>EM384. ANYL METH FOR ENGR MANAGEMENT</td>
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<tr>
<td></td>
<td>EM402. ENGINEERING MANAGEMENT DSN I</td>
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<tr>
<td></td>
<td>EM403. ENGINEERING MANAGEMENT DSN II</td>
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<tr>
<td></td>
<td>EM411. PROJECT MANAGEMENT</td>
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<td></td>
<td>EM420. PRODUCTION OPERATIONS NGMT</td>
</tr>
<tr>
<td></td>
<td>EM481. SYSTEMS SIMULATION</td>
</tr>
<tr>
<td></td>
<td>EM482. SUPPLY CHAIN ENG &amp; INFO NGMT</td>
</tr>
<tr>
<td></td>
<td>MG382. HUMAN RESOURCE MANAGEMENT</td>
</tr>
</tbody>
</table>
Similarities Identified in EM Program offerings

Based on Table 3, the authors have identified the following similarities in the EM programs at the undergraduate level. Starting off with the fundamental engineering mathematics, it is safe to say that the majority of the programs include Engineering Statistics as one of their primary courses and later on more advanced courses such as Discrete System Simulation and Modeling are introduced. Ensuing courses such as Engineering Economy, Finance and Cost Estimation are offered by the majority of the EM programs considered by the authors. Moving on to more advanced courses, such as Operations Research, Production Management and Operations Planning, Control and Scheduling are provided by almost all the programs. However, despite having similar titles for the courses, the course content did vary from school to school. Supply Chain Management was rarely covered and mostly included as a module under operation research courses. Unlike Supply Chain Management, Total Quality Management and related topics such as: Lean Engineering and Six-Sigma however have attracted a great deal of attention and are well established among EM programs. Systems Engineering, Manufacturing Design (CAD) and Sustainability courses are the gaps identified by the authors in the EM programs. The Systems Engineering and CAD courses are offered by only four programs under different titles. On reviewing the program websites, there has been no offering of sustainability related courses. Lastly, project management is offered by a considerable number of the programs. Table 4 shows the EM programs along with the list of offered courses. In order to better identify the similarities
between the programs, all the similar courses have been highlighted in different colors. The authors have divided the courses into nine major categories, based on the material covered in each course. Furthermore, some courses are merged together in one category depending on the similarity between their contents.

Table 4: Schematic of classification of Topics and listing of courses in EM Programs

<table>
<thead>
<tr>
<th>University</th>
<th>Program</th>
<th>Courses</th>
</tr>
</thead>
</table>
| Clarkson University | Engineering and Management  | EM 120 Team-based Design & Innovation  
EM 121 Technological Entrepreneurship  
EM 331 Operations & Supply Chain Management  
EM 333 Operations Research  
EM 351 Quality Management & Lean Enterprise  
EM 480 Project Management  
EM 456 Senior Design  
EM 208 Accounting  
EM 211 Enterprise Info. Systems  
EM 288 Org. Behavior I  
EM 432 Org. Policy & Strategy  
EM 310 Prof. Experience  
SYS 3010 - Principles and Methods of Industrial and Systems Engineering  
SYS 3060 - Systems Optimization |
<table>
<thead>
<tr>
<th>Institution</th>
<th>Course List</th>
</tr>
</thead>
<tbody>
<tr>
<td>George Washington Univ</td>
<td>Engineering Management and Systems Engineering</td>
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<td></td>
<td>Fundamentals of Systems Engineering</td>
</tr>
<tr>
<td></td>
<td>Operations Research Methods</td>
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<tr>
<td></td>
<td>Systems Thinking and Policy Modeling I</td>
</tr>
<tr>
<td></td>
<td>Discrete Systems Simulation</td>
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<td></td>
<td>Requirements Analysis and Elicitation</td>
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<td></td>
<td>Quantitative Models in Systems Engineering</td>
</tr>
<tr>
<td></td>
<td>Critical Infrastructure Systems</td>
</tr>
<tr>
<td></td>
<td>Systems Engineering Senior Project</td>
</tr>
<tr>
<td></td>
<td>Survey of Finance and Engineering Economics</td>
</tr>
<tr>
<td></td>
<td>Applied Optimization Modeling</td>
</tr>
<tr>
<td></td>
<td>Quality Control and Acceptance Sampling</td>
</tr>
<tr>
<td></td>
<td>Data Analysis for Engineers and Scientists</td>
</tr>
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<td>Missouri Tech</td>
<td>Engineering Management</td>
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<td>Accounting</td>
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<td></td>
<td>Marketing I</td>
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<td>Management Styles</td>
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<td>Project Management</td>
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<td>Human Resource Management</td>
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<td>Rensselaer Polytechnic</td>
<td>Engineering and Management Engineering</td>
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<td>ENGR 1010 - Professional Development I</td>
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<td></td>
<td>ENGR 1100 - Introduction to Engineering Analysis</td>
</tr>
<tr>
<td></td>
<td>ENGR 1200 - Engineering Graphics and CAD</td>
</tr>
<tr>
<td></td>
<td>ENGR 1300 - Engineering Processes</td>
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<td></td>
<td>ENGR 1400 - Engineering Communications</td>
</tr>
<tr>
<td></td>
<td>ENGR 1600 - Materials Science for Engineers</td>
</tr>
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<td>ENGR 2020 - Product Design and Innovation Design Studio II</td>
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<tr>
<td></td>
<td>ENGR 2050 - Introduction to Engineering Design</td>
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<td></td>
<td>ENGR 2090 - Engineering Dynamics</td>
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<td></td>
<td>ENGR 2250 - Thermal and Fluids Engineering I</td>
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<td></td>
<td>ENGR 2300 - Electronic Instrumentation</td>
</tr>
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<td></td>
<td>ENGR 2350 - Embedded Control</td>
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<tr>
<td></td>
<td>ENGR 2530 - Strength of Materials</td>
</tr>
<tr>
<td></td>
<td>ENGR 2600 - Modeling and Analysis of Uncertainty</td>
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<td></td>
<td>ENGR 2710 - General Manufacturing Processes</td>
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<td>ENGR 2720 - Computer Aided Machining</td>
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<td>ENGR 2940 - Engineering Project</td>
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<td></td>
<td>ENGR 2960 - Topics in Engineering</td>
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<td></td>
<td>ENGR 4010 - Professional Development III</td>
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<td>ENGR 4100 - Business Issues for Engineers and Scientists</td>
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<td></td>
<td>ENGR 4700 - Introduction to Manufacturing Planning</td>
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<td>ENGR 4710 - Manufacturing Processes and Systems Laboratory I</td>
</tr>
<tr>
<td></td>
<td>ENGR 4720 - Manufacturing Processes and Systems Laboratory II</td>
</tr>
<tr>
<td></td>
<td>ENGR 4750 - Engineering Economics and Project Management</td>
</tr>
<tr>
<td></td>
<td>ENGR 4760 - Engineering Economics</td>
</tr>
<tr>
<td>Saint Mary's Univ</td>
<td>Engineering Management</td>
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<td></td>
<td>EG 2322 - Work Design &amp; Product Measure</td>
</tr>
<tr>
<td></td>
<td>EG 2325 - Industrial Automation &amp; Control</td>
</tr>
<tr>
<td></td>
<td>EG 2341 - Fundamentals of Logic Design</td>
</tr>
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<td></td>
<td>EG 3322 - Industrial Statistics</td>
</tr>
<tr>
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<td>EG 3333 - Lean Production Systems</td>
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<tr>
<td></td>
<td>EG 3334 - Engineering Economy</td>
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<tr>
<td></td>
<td>EG 3336 - Applied Optimi. &amp; Analysis</td>
</tr>
<tr>
<td></td>
<td>EG 3337 - Supply Chain Management</td>
</tr>
<tr>
<td></td>
<td>EG 4330 - Quality Control &amp; Reliability</td>
</tr>
<tr>
<td>Institution</td>
<td>Courses</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Stevens Institute of Technology | Management of Engineering and Technology  
Project Management  
Accounting & Business Analysis  
Engineering Design VI  
Modeling and Simulation  
Production and Operations Management  
Analysis of Networks and Strategies  
Engineering Economics  
Elements of Operations Research  
Total Quality Management  
Statistics for Engineers Laboratory  
Statistics for Engineering Managers  
Innovative System Design  
Engineering Design VII  
Engineering Design VIII  
Business Process Reengineering  
Logistics and Supply Chain Management  
Analysis of Networks & Strategies  
Total Quality Management |
| University of Arizona | SIE 265 Engineering Management I  
SIE 2955 Systems & Industrial Engineering Sophomore Colloquium  
SIE 270 Mathematical Foundations of Systems and Industrial Engineering  
SIE 305 Introduction to Engineering Probability and Statistics  
SIE 340 Deterministic Operations Research  
SIE 367 Engineering Management II  
SIE 457 Project Management  
SIE 431 Simulation Modeling and Analysis  
SIE 415 Technical Sales and Marketing  
SIE 462 Production Systems Analysis  
ENGR 498A or SIE 498ASenior Design Projects I  
ENGR 498B or SIE 498BSenior Design Projects II  
SIE 414 Law for Engineers and Scientists  
SIE 406 Quality Engineering  
SIE 464 Cost Estimation |
| University of Pacific | EMGT 155. Computer Simulation  
EMGT 170. Engineering Administration  
EMGT 172. Engineering Economy  
EMGT 174. Engineering Project Management  
EMGT 176. Systems Engineering Management  
EMGT 191. Independent Study  
EMGT 195. Engineering Management Synthesis  
EMGT 197. Undergraduate Research |
| United States Military Academy | EM381 ENGINEERING ECONOMY  
EM384 ANYL METH FOR ENGR MANAGEMENT  
EM402 ENGINEERING MANAGEMENT DSN I  
EM403 ENGINEERING MANAGEMENT DSN II  
EM411 PROJECT MANAGEMENT  
EM420 PRODUCTION OPERATIONS MGMT  
EM461 SYSTEMS SIMULATION  
EM482 SUPPLY CHAIN ENG & INFO MGMT  
MG382 HUMAN RESOURCE MANAGEMENT |
Recommendations to improve the broader range of undergraduate EM divisions:

After having discussions with a number of industry professionals and based on the categories of courses identified in Table 4, the authors would recommend the following changes to be made to the undergraduate EM programs:

Concordant to the increasing market’s needs for well-rounded engineers with technical backgrounds it is strongly recommended to re-structure EM programs in a way to educate students in technical aspects of engineering first and later introduce supplemental managerial courses to establish an exceptional program for entry-level students seeking job opportunities in the market. Furthermore, it’s imperative to include fundamental design courses in order to make EM programs well-balanced and prepare students for manufacturing and engineering management jobs.

In today’s business environment, it’s nearly impossible to run a business without having the knowledge of at least one computer programming language. Therefore it is strongly recommended to at least offer some basic computer programming courses as a part of the electives offered in EM programs. Additionally, due to the vital role of Supply Chain Management in the success of any business, it is recommended to engage students with more supply chain related courses during their undergraduate studies and provide them with more
practical opportunities enabling them to apply their academic knowledge in a real world environment. In line with the last point it is encouraged to involve students in more practical projects preferably as a group in which the real time projects are well simulated to establish a unique opportunity for the students to deal with day to day challenges of a real project. Bringing in guest speakers from industry to exemplify concepts taught in class could also enhance the students’ understanding of the subjects as well as serve as a networking opportunity for students. Lastly, entrepreneurship and innovation is one of the major drivers in today’s economy and thus has received a great deal of attention from engineering programs across the country. Providing students with such courses as Engineering Innovation Management will allow them to explore new possibilities and bring added value to the organizations they work at.

Future Research

Based on the recommendations made, before implementing them, the authors will be creating surveys to evaluate their recommendations and prioritize course offerings in the undergraduate program. These surveys will be sent out to both students as well as industry professionals and employers, since they are all stakeholders in this process.

References:


